

NEMA EMP

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**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED
EXPANSION OF A DANGEROUS GOODS STORAGE FACILITY WITHIN THE
GREATER TUBATSE LOCAL MUNICIPALITY, LIMPOPO PROVINCE**

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ENVASS REF. NO: 101-17_18

Submitted to:

Limpopo Department of Economic Development, Environment and
Tourism

"Your Partner in Calculating Environmental Solutions"

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ENVIRONMENTAL ASSURANCE (Pty)Ltd



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ABBREVIATIONS

AEL	Air Emissions License
ASTM	American Standard for Testing and Materials Method
BIC	Bushveld Igneous Complex
CA	Competent Authority
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
ESM	Environmental Site Manager/ Internal Environmental Officer
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
ENVASS	Environmental Assurance (Pty) Ltd
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LPG	Liquefied Petroleum Gas
LSR	Light Straight-run Naphtha
NEMA	National Environmental Management Act (Act No. 107 of 1998) [as amended]
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004) [as amended]
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004) [as amended]
NEM:WA	National Environmental Management: Waste Act (Act No. 58 of 2009) [as amended]
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NVFFA	National Veld and Forest Fire Act (Act No.101 of 1989) [as amended]
NWA	National Water Act (Act No. 36 of 1998) [as amended]
PAIA	Promotion of Access to Information Act (Act No. 2 of 2000)
PPE	Personal Protective Equipment
SAHRA	South African Heritage Resources Agency
SANS	South African National Standard
SDS	Safety Data Sheet
WMA	Water Management Area


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GLOSSARY OF TERMS

Applicant / Developer	Any person who applies for an authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 983, 984 and 985. The Applicant for this project is Tubatse Chrome (Pty) Ltd.
Archaeological resources	<p>Buildings are among the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Farming Community settlements. The Act identifies heritage objects as:</p> <ul style="list-style-type: none">• Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimen;• Visual art objects;• Military objects;• Numismatic objects;• Objects of cultural and historical significance;• Objects to which oral traditions are attached and which are associated with living heritage;• Objects of scientific or technological interest;• Books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 Of 1996), or in a provincial law pertaining to records or archives; and• Any other prescribed category.
ASTM	The American Standard for Testing and Materials method D1739, which is the standard method for the collection and measurement of dust fall.
Biodiversity	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Building and demolition waste	Waste (excluding hazardous waste) produced during construction of and or alteration of structures and buildings.

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Construction activities	Activities associated with physical disturbance to the land, including storage of machinery, equipment and materials.
Construction phase	The construction phase is the period of commencement of physical disturbance to the land, excluding rehabilitation activities, such as re-vegetation and replacing of topsoil.
Container	Disposable or re-usable vessel in which waste is placed for the purpose of storing, accumulating, handling, transporting, treating or disposing of that waste and which includes bins, bin liners and skips.
Contaminated water	Any water contaminated by activities carried out by the Applicant, e.g. waste water and runoff from the siding, personnel wash areas and spills, etc.
Contractor	Persons/organisations contracted by the Applicant to provide a service. The Contractor shall ensure compliance with this EMPR and shall request advice from the Environmental Assessment Practitioner where considered necessary and appropriate.
Corrective (or remedial) action	Response required to address an environmental challenge that is in conflict with the requirements of the EMPR. The need for corrective action may be determined through monitoring, audits or management review.
Degradation	The lowering of the quality of the environment through human activities e.g. river and soil degradation.
Disposal	The burial, deposit, discharge, abandoning, dumping, placing or release of waste into or onto any land.
Domestic waste	Waste (excluding hazardous waste) that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes (including garden and park wastes as well as municipal and food waste).
Emergency	An unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.
Ecology	The study of the interrelationships between organisms and their environments.
Environment	The surroundings within which humans live and that consist of:

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- (i) The land, water and atmosphere of the earth;
- (ii) Micro-organisms, plant and animal life;
- (iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Audit

A systematic, documented verification process of objectively obtaining and evaluating evidence to determine whether specified environmental activities, events, conditions, management systems, or information about these matters conform with audit criteria and communicating the results of this process to the Applicant.

Environmental Impact Assessment

In relation to an application, to which a Basic Assessment must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Management Programme

A legally binding working document, which stipulates environmental and socio-economic mitigation measures which, must be implemented by several responsible parties throughout the duration of the proposed project.

General waste


Waste that does not pose an immediate threat or hazard to health or to the environment, and includes:

- (a) Domestic waste;
- (b) Building and demolition waste;
- (c) Business waste;
- (d) Inert waste; and
- (e) Any waste classified as non-hazardous waste in terms of the regulations made under section 69 of the National Environmental Management: Waste Act (Act .58 of 2009) [as amended]

Groundwater	All subsurface water that fills voids between highly permeable ground strata comprised of sand, gravel, broken rocks, porous rocks, etc. and move under the influence of gravitation.
Hazardous waste	Waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
Holder of waste	Any person who imports, generates, stores, accumulates, transports, processes, treats or exports waste or dispose of waste.
Impact	The potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Inert waste	Waste that- <ul style="list-style-type: none"> (a) Does not undergo significant physical, chemical or biological transformation after disposal; (b) Does not burn, react physically or chemically, biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and (c) Does not impact negatively on the environment because of its pollutant content and because the toxicity of its leachate is insignificant and which include discarded concrete, bricks, tiles and ceramics; discarded glass as well as discarded soil, stones and dredging spoil.
Infrastructure	The network of facilities and/or services that are required for economic activities e.g. roads, railways, electricity, water and sewerage.
Integrated	Mixing or combining all useful information and factors into a joint or unified whole.
Integrated Environmental Management (IEM)	A way of managing the environment by including environmental factors in all stages of the development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments.

Interested and/or Affected Parties	Those individuals or organisations that have an interest in the proposed development or will be directly affected by the activities of the development, as identified in the Environmental Impact Assessment (EIA) process.
Mitigation measures	Measures designed to avoid, reduce or remedy adverse impacts.
Natural environment	Our physical surroundings, including plants and animals, when they are unspoiled by human activities.
Pollutant	A contaminant at a concentration high enough to endanger the environment or the public health.
Pollution	<ul style="list-style-type: none"> • National Water Act, 1998 (Act No. 36 of 1998) [as amended]: <i>“Water pollution means the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it –</i> <ul style="list-style-type: none"> <i>(a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or</i> <i>(b) harmful or potentially harmful –</i> <ul style="list-style-type: none"> <i>(aa) to the welfare, health or safety of human beings;</i> <i>(bb) to any aquatic or non-aquatic organisms;</i> <i>(cc) to the resource quality; or</i> <i>(dd) to property”.</i> • National Environmental Management Act (Act No. 107 of 1998) [as amended]:- <i>“pollution means any change in the environment caused by –</i> <ul style="list-style-type: none"> <i>(i) substances;</i> <i>(ii) radioactive or other waves; or</i> <i>(iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.”</i>

Recycle	A process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separate materials as a product or raw material.
Rehabilitation	Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) in which it was before disruption.
Re-use	To utilise the whole, a portion of or a specific part of any substance, material or object form the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object.
SANS 10103	Latest edition of the South African National Standard Globally harmonised System for the measurement and rating of environmental noise with respect to annoyance and to speech communication.
SANS 10234	Latest edition of the South African National Standard Globally harmonised System of the Classification and Labelling of Chemicals (GHS).
SANS 10328	Latest edition of the South African National Standard Globally harmonised System Methods for environmental noise impact assessments are used for the assessing of the noise impact.
Storage	The accumulation of waste in a manner that does not constitute a treatment or disposal of that waste
Waste	<p>(a) <i>any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the National Environmental Management Waste Act, 2009 (Act No. 58 of 2009) [as amended].</i></p> <p>(b) <i>any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,</i></p> <p><i>but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste –</i></p>

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- (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
- (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;
- (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or
- (iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition

Waste classification

Establishing:


- (a) Whether a waste is hazardous based on the nature of its physical, health and environmental hazardous properties (hazard classes); and
- (b) The degree or severity of the hazard posed (hazard categories).

Waste generator

Any person whose actions, production processes or activities including waste management activities, results in the generation of waste.

Waste management

Classifying, recycling, treatment and disposal of waste generated during operational activities.

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1. KEY PROJECT INFORMATION

Project name: Expansion of a dangerous goods storage facility
Applicant: Tubatse Chrome (Pty) Ltd
Property Description: The remaining extent of the Farm Goudmyn 337 KT
21 Digit Surveyor General Code: TOKT00000000033700006

1.1 Details of the Applicant


Table 1: Applicant Details

Project applicant:	Tubatse Chrome (Pty) Ltd		
Business reg. no. /ID. no.:	2006/036994/07		
Contact person:	Mr Jacques van Niekerk		
Postal address:	Private Bag X504, Steelpoort, 1133		
Telephone:	013 230 8228	Cell:	082 327 4308
E-mail:	Jacques.VanNiekerk@samancorCr.com	Fax:	013 230 9401

1.2 Environmental Consulting/Project Team [Regulation 33 (a) (i) and (ii)]

Table 2: Details and Expertise of the Environmental Assessment Practitioner

Environmental Assessment Practitioner/Firm:	Environmental Assurance (Pty) Ltd [ENVASS]
Business reg. no. /ID. no	2004/026655/07
Project Team	<ul style="list-style-type: none"> • Corrie Retief (Senior Environmental Consultant) (Pri. Sci. Nat) [BA(ENV), BA Hons. Geography]; • Monica Niehof (Environmental Consultant) [B.Sc. Hons. Environmental Management (3)]; and • Liezl Taylor (Environmental Consultant) [B.Sc.] [B.Sc. Hons.] [M.Sc. Environmental Ecology (5)]; • Du Toit Wilken (Senior Operations Manager) [M.Sc. Env. Sci.]
Environmental Consultant	Corrie Retief
Expertise of EAP	<p>ENVASS has the necessary experience within our project team to carry out the NEMA Basic Assessment processes. Auditing, WULA, MPRDA, BA (NEMA) and EIA (NEMA) projects have been completed throughout South Africa:</p> <ul style="list-style-type: none"> • Makoya Supply Chain Holdings (Blinkpan Railway Siding); • Samancor Chrome; • Amari Resources; • South African Coal Mine Holdings Limited; • Canyon Coal; • Eastplats; • Coal of Africa; • NUcOAL (Woestalleen Siding) • Assmang BRMO; and • Shanduka Coal.
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2. INTRODUCTION

Environmental Assurance (Pty) Ltd (ENVASS) was appointed by Tubatse Chrome (Pty) Ltd (hereinafter referred to as Tubatse Chrome) to apply for Environmental Authorisation for the proposed expansion of a dangerous goods storage facility. The study area is situated on the remaining extent of Portion 6 of the Farm Goudmyn 337 KT, in the town of Steelpoort, within the Greater Tubatse Local and Greater Sekhukhune District Municipalities in the Limpopo Province of South Africa (refer to Figure 1 and 2 for a locality map of the study area).

The proposed development with its associated infrastructure and activities requires the following authorisations:


- Environmental Authorisation (EA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA) from the Competent Authority (CA) regulating environmental aspects, the Limpopo Department of Economic Development, Environment and Tourism (LEDEDET); and
- Air Emissions License (AEL) in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) from the Competent Authority (CA) regulating air quality aspects, the Limpopo Department of Economic Development, Environment and Tourism (LEDEDET).

Environmental Assurance (Pty) Ltd (hereinafter referred to as ENVASS) has been appointed to ensure that the development will be carried out in accordance with the Environmental Impact Assessment (EIA) Regulations [as amended] which was promulgated in December 2014 under the National Environmental Management Act (No. 107 of 1998) (NEMA) [as amended]. All relevant legislation has been consulted during the Basic Assessment process and was complied with at all times.

This Environmental Management Programme (EMPr) is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of NEMA. NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an Environmental Management Programme (EMPr).

3. OBJECTIVES OF THE EMPr

This EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be undertaken during all the phases of the development, including the construction, operational and decommissioning phases, of the proposed activity, as well as to ensure that all relevant factors are considered to achieve an environmentally responsible development. This EMPr informs all relevant parties [the applicant, the Site Manager, the Contractor, the Environmental Site Manager (ESM), and all other staff employed on-site] as to their duties in the fulfilment of the legal


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requirements for the decommissioning and rehabilitation phases of the development with particular relevance to the prevention and mitigation of anticipated potential environmental impacts.

The objectives of the EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr related activities (mitigation measures) are consistent with the significance of the project's impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement on environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant level;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimise beneficial impacts;
- Create management structures that addresses the concerns and complaints of the I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the development;
- Ensure that safety recommendations are complied with; and
- Specific time periods within which the measures contemplated in the final EMPr should be implemented, where appropriate.

The point of departure for this EMPr is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. Therefore, the purpose of an EMPr is to provide management measures that should be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a proposed development are minimised. It should also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues / measures that might be considered left out or not adequate and / or delete issues / measures deemed not relevant to the project. In such instances, the approving authority may authorise the Environmental Control Officer (ECO) to make such changes.


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4. FORMAT AND STRUCTURE OF THE EMPR

This EMPr has been compiled in accordance with Section 24N (2) of NEMA and with Appendix 4 of GN R 982 (as amended), which states that an EMPr must include all the information listed in Table 1.

Table 3: Content of the EMPR

No.	Description	Section in the EMPr
1. (1)	An EMPr must comply with section 24N of the Act and include:	-
(a)	details of (i) the EAP who prepared the EMPr; and	Refer to Annexure of the Draft Basic Impact Assessment Report
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Refer to Annexure of the Draft Basic Impact Assessment Report
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 6 Page 21
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 7 Page 29
(d)	a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 8 Page 30
	(i) planning and design;	No impacts are expected during the planning and design phase.
	(ii) pre-construction activities;	No impacts are expected during the planning and design phase.
	(iii) construction activities;	Section 8.1 – Table 6 Page 30
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	Section 8.1 – Table 6 Page 30
(v) where relevant, operation activities;	Section 8.2 – Table 7 Page 59	
(e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 8.1 – Table 6 Page 30 Section 8.2 – Table 7

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No.	Description	Section in the EMPr
		Page 59
	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Section 8.1 – Table 6 Page 30 Section 8.2 – Table 7 Page 59
(f)	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation	Section 8.1 – Table 6 Page 30 Section 8.2 – Table 7 Page 59
	(ii) comply with any prescribed environmental management standards or practices;	Section 8.1 – Table 6 Page 30 Section 8.2 – Table 7 Page 59
	iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	N/A
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	N/A
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 8 Page 30 Table 6 and 7 Section 9 Page 91
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 8 Page 30 Table 6 and 7 Section 9 Page 91
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 8 Page 30 Table 6 and 7
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 8 Page 30 Table 6 and 7
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 8 Page 30 Table 6 and 7 Section 9 Page 91
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 10 Page 94
(m)	an environmental awareness plan describing the manner in which-	Section 11 Page 95
	(i) the applicant intends to inform his or her employees of any	-

No.	Description	Section in the EMPr
	environmental risk which may result from their work; and	
	ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	-
(n)	any specific information that may be required by the competent authority.	N/A

This EMPr, which forms an integral part of the contract documents, informs the Contractor(s) as to his duties in the fulfilment of the project objectives, with particular relevance to the prevention and mitigation of environmental impacts caused by construction and operational activities associated with the project. The Contractor(s) should note that obligations imposed by the approved EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contracts that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail. The Contractor(s) shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the development.

5. IMPLEMENTATION OF THE EMPr

5.1 Legal Status

By virtue of the fact that this document describes mitigation measures that influence the outcome of the Environmental Authorisation process for this project, its implementation will be a requirement of the EA issued by LEDET, and there exists a legal obligation for the specifications of this EMPr to be complied with. The EMPr includes all relevant documentation contained or referred to within it, along with any amendments or appendices to this document. The EMPr forms part of all Contract Documentation and is thus a legally binding document.

5.2 Legislative Context

The specifications and mitigation measures outlined in this EMPr must comply with relevant legislation and conditions of the Environmental Authorisation as issued by LEDET. Of particular importance is Section 28 (1) of NEMA which places an obligation on all individuals to take due care of the environment and to ensure remedial action is instituted to prevent and/or minimise and mitigate environmental impacts. In terms of this Act an individual responsible for environmental damage must pay costs both to environment and human health and the preventative measures to reduce or prevent additional pollution and / or environmental damage from occurring. This is referred to as the Polluter Pays Principle. Listed in Table 4 below is the key legislation (relevant laws, permits and authorisations) applicable to the development. All relevant approvals and permits, or any other management requirements in terms of this, or any other legislation applicable to the development, as well as any future amendments to such legislation, are to be complied with. It should be noted that this is not a comprehensive list of all legislation that may apply, only those deemed most relevant to this context.


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Table 4: Legislative Context

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Constitution of the Republic of South Africa, 1996 (Act No. 106 of 1996)	<p>The CSA is the supreme law of the country of South Africa. It provides the legal foundation for the existence of the republic, sets out the rights and duties of its citizens, and defines the structure of the government.</p> <p>The CSA states that every person has the right <i>(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –</i></p> <p><i>(i) prevent pollution and ecological degradation;</i> <i>(ii) promote conservation; and</i> <i>secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</i></p>	South African Government	1996
National Environmental Management, 1998 (Act No. 107 Of 1998) [as amended] (NEMA)	<p>Section 24: Application for Environmental Authorisation</p> <p>Section 28: Duty of Care</p>	Limpopo Department of Economic Development, Environment and Tourism (LEDET)	1998
Environmental Impact Assessment Regulations of 2014 (As amended in 2017)	The proposed activity is listed in the EIA Regulations of 2014 (as amended in 2017) and published in Government Notice (GN) No. 594 in terms of Section 24 of NEMA and, therefore, requires environmental authorisation.	Limpopo Department of Economic Development, Environment and Tourism (LEDET)	2014
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The Biodiversity act provides for the management and protection of the country's biodiversity within the framework established by NEMA. Among other	Department of Environmental Affairs (DEA)	2004

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>objectives, it provides for the protection of species and ecosystems in need of protection and sustainable use of indigenous biological resources. Also, to combat and control weeds as well as the elimination of invader plant species.</p> <p>During the construction, operational and decommissioning phases of the proposed activity, the prevention of alien invasive species spreading into the surrounding areas as well as the eradication thereof should be a priority. Mitigation measures in this report and the EMPr with regards to fauna and flora, should be implemented in order to adhere to this act.</p>		
<p>National Water Act, 1998 (Act No. 36 of 1998) [as amended]</p>	<p>The purpose of the act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account several factors. The factors specifically applicable to the proposed activity are listed below:</p> <ul style="list-style-type: none"> • Promoting the efficient, sustainable and beneficial use of water in the public interest; • Facilitating social and economic development; • Protecting aquatic and associated ecosystems and their biological diversity; and • Reducing and preventing pollution and degradation of water resources. <p>The proposed activity does not trigger any water uses that are required to be authorised by the Department, however, the activity must comply with all the relevant regulations and guidelines that are provided for.</p>	<p>Department of Water and Sanitation (DWS)</p>	<p>1998</p>
<p>National Heritage Resources Act, 1999) Act No. 25 of 1999)</p>	<p>The purpose of the act is to regulate the country's heritage resources and provide an integrated and interactive system for the management of national</p>	<p>South African Heritage</p>	<p>1999</p>

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	heritage resources and makes provision for the potential destruction to existing heritage sites.	Resources Agency (SAHRA)	
Animals Protection Act, 1962 (Act No. 71 of 1962)	(i) The act consolidates and amends the laws relating to the prevention of cruelty to animals. It is possible that the proposed activity could have an effect on the surrounding biodiversity including fauna and adherence to this act is therefore crucial. Mitigation measures in this report and the EMPr with regard to fauna, should be implemented in order to adhere to this act.	The Department of Agriculture, Forestry and Fisheries (DAFF)	1962
Societies for the Prevention of cruelty to Animals Act, 1993 (Act No. 169 of 1993)	It is possible that the proposed activity could have an effect on the surrounding biodiversity including fauna, and adherence to this act is therefore crucial. Mitigation measures in this report and the specialist studies, and the EMPr with regards to fauna, should be implemented in order to adhere to this act.	The Department of Agriculture, Forestry and Fisheries (DAFF)	1993
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	<p>The purpose of the Promotion of Access to Information Act is to give effect to the constitutional right of access to any information held by the state, as well as information held by another person that is required for the exercise or protection of any right.</p> <p>The motivation for giving effect of the right to access to information is to foster a culture of transparency and accountability both in public and private bodies and to promote a society in which the people of South Africa have effective access to information to enable them to more fully exercise and protect all their rights.</p> <p>Stakeholders and Interested and Affected Parties affected by the proposed development, therefore have a right to access all documentation required by the competent authority to make an informed decision. The</p>	The National Department of Justice and Constitutional Development	2000

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	affected persons also have the right to comment and object on decisions that affects them.		
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended]</p> <ul style="list-style-type: none"> Section 16 General duty in respect of waste management; Section 17; Reduction, re-use, recycling and recovery of waste; Section 21 General requirements for storage of hazardous and general waste. 	The development activities will produce general and potentially hazardous waste which needs to be managed and disposed of according to best practices such as recycling, safe storage, etc.	Department of Environmental Affairs (DEA)	2008
Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended].	The activities associated with the proposed expansion, shall be in accordance with the regulations and Norms and Standards.	Department of Environmental Affairs (DEA) and the Department of Water and Sanitation (DWS)	2013
SANS 10234: Classification	The SANS 10234 – Global Harmonisation System (GHS) standard, sets the criteria for the classification of hazardous substances and mixtures, including waste, according to health, environmental and physical		

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>hazards, and includes communication elements for labelling and information required for Safety Data Sheets (SDS's). Unlike the Minimum Requirements, the SANS standard do not prescribe any specific obligations based on whether a waste is hazardous or not, nor the type of landfill where these wastes must be disposed of. Rather, the purpose is to ensure adequate and safe storage and handling of hazardous waste, and to inform the consideration of suitable waste management options.</p>		
<p>Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended]</p> <ul style="list-style-type: none"> Section 12 (1) <p>Duty of the landowner to prevent fire from spreading to neighbouring properties.</p>	<p>Cautionary steps in avoiding the spread of fires to and from neighbouring properties shall be taken.</p>	<p>The Department of Agriculture, Forestry and Fisheries (DAFF)</p>	<p>1998</p>
<p>Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2014 in terms of NEMBA (Government Notice 599 of 2014)</p> <p>Notice 2</p> <p>Exempted Alien Species in terms of Section 66 (1)</p> <p>Notice 3</p> <p>National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11</p> <p>Notice 4</p>	<p>It is the responsibility of the Applicant to ensure that all prohibited plant and animal species are eradicated as far as possible, during all phases of the activity.</p>	<p>The Department of Agriculture, Forestry and Fisheries (DAFF)</p>	<p>2014</p>

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12			
Conservation of Agricultural Resources Act (no. 43 of 1983) Section 5 Prohibition of spreading of weeds Section 12 Maintenance of soil conservation works and maintenance of certain states of affairs Section 16 Regional Conservation Committees	Listed invader/alien plants present on site which requires management measures to be implemented to strive to maintain the status quo environment through the guidelines provided by the Regional Conservation Committee.	The Department of Agriculture, Forestry and Fisheries (DAFF)	1983
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended] Section 32 Control of dust Section 34 Control of noise	Impacts on surrounding landowners need to be managed through dust and noise mitigation measures.	The Limpopo Department of Economic Development, Environment and Tourism (LEDET)	2004
National Dust Control Regulations, 2013 (Government Notice 827 of 2013) Section 3 Dust fall standard Section 4 Dust fall monitoring program Section 6 Measures for control of dust	Dust fallout need to be monitored in accordance to the standards set out in the monitoring programme with the specified measures due to the Applicant being liable to offences and penalties associated with non-conformance to dust which may influence employees and surrounding landowners.	The Limpopo Department of Economic Development, Environment and Tourism (LEDET)	2013


Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
<p>Section 7 Ambient air quality monitoring (PM10) Section 8 Offences Section 9 Penalties</p> <p>Section 53 (o) read with Section 32 of NEMAQA.</p>			
<p>National Pollution Prevention Plan Regulations, 2017 (Government Notice 712 of 2017)</p> <p>The purpose of the regulations is to prescribe the requirements that pollution prevention plans of greenhouse gases declared as priority air pollutants need to comply with in terms of section 29(3) of NEMAQA.</p> <p>Greenhouse gases generated from the production processes listed in Annexure A of the Regulations and their activities reported in accordance with the National Greenhouse Gas Emission Reporting Regulations.</p>	<p>Coal mining is listed in Annexure A of the Regulations, requiring that an Air Pollution Prevention Plan be submitted. The plan is currently being drafted and will be submitted to the relevant Competent Authority for approval.</p>	<p>Limpopo Department of Economic Development, Environment and Tourism (LEDET)</p>	<p>2017</p>
<p>Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] Section 2</p>	<p>The Applicant must ensure the safety of people working with hazardous chemicals (specifically fuels), as well as safe storage, use and disposal of containers during the on-site operational phase together with the associated</p>	<p>Limpopo Department of Economic Development,</p>	<p>1973</p>

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Declaration of grouped hazardous substances; Section 4 Licensing; Section 16 Liability of employer or principle Section 9 (1) Storage and handling of hazardous chemical substances Section 18 Offences	Liability should non-compliance be at the order of the day.	Environment and Tourism (LEDET)	
Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995) Section 4 Duties of persons who may be exposed to hazardous chemical substances Section 9A (1) Penalties	Hazardous substances will be stored and utilised on the site and non-compliance to management measures will result in prosecution of the Applicant in terms of his liabilities to the socio-economic environment.	Limpopo Department of Economic Development, Environment and Tourism (LEDET)	1995
NEMA: GN. 807 Public Participation Guideline, October 2012	Consultation with Interested and Affected Parties and Communities.	LEDET	2012
SANS 1929: Ambient Air Quality – Limits for Common Pollutants	Impacts on surrounding landowners need to be managed through dust mitigation measures.	LEDET	
SANS 1137: Standard test method for the collection and measurement of dust fall (settleable particulate matter).	Impacts on surrounding landowners need to be managed through dust mitigation measures.	-	-

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
SANS 10234: 2008 Globally Harmonised Systems of classification and labelling of chemicals (GHS) Government Notice 634. August 2013: Waste Classification	All dangerous goods on site need to be managed according to these standards.	LEDET	2008
SANS 10228:2006 The Identification and Classification of Dangerous Goods for Transport	All dangerous goods to be transported to and from the site need to be managed according to these standards.	LEDET	2006
ASTM d 1739, 1970 or equivalent approved protocol for dust monitoring.	Impacts on surrounding landowners need to be managed through dust mitigation measures.	LEDET	-
All other relevant national, provincial, district and local municipality legislation and guidelines that may be applicable to the application. Some of these are discussed in the next section, but will be discussed in detail within the EIA / EMP report.			

5.3 EMPr Organisational Structure: Roles and Responsibilities

The Applicant, with assistance from the Site Manager, is responsible for the implementation of the EMPr and for internal compliance monitoring of the EMPr. The EMPr will be made binding on all contractors operating on-site and will be included with the official contract documentation of each of the principal contractors to be appointed to the contract. The Applicant must appoint an internal Environmental Site Manger (ESM), who will monitor and facilitate compliance with the EMPr and other conditions of approval as they relate to environmental matters. All Contractors must inform the ESM immediately of events that have / will cause serious environmental damage or of any breaches of the Environmental Authorisation and EMPr. The ESM will then inform the Applicant which must then immediately inform the Competent Authority (CA) and the Local Authority, within 24 hours of such events and the measures taken to address them. Details of the management and implementation structures for this EMPr, as applicable to the construction, operational, decommissioning and rehabilitation phases showing official communication and reporting lines (including instructions, directives and information), are presented in Table 5 and Figure 1 below.

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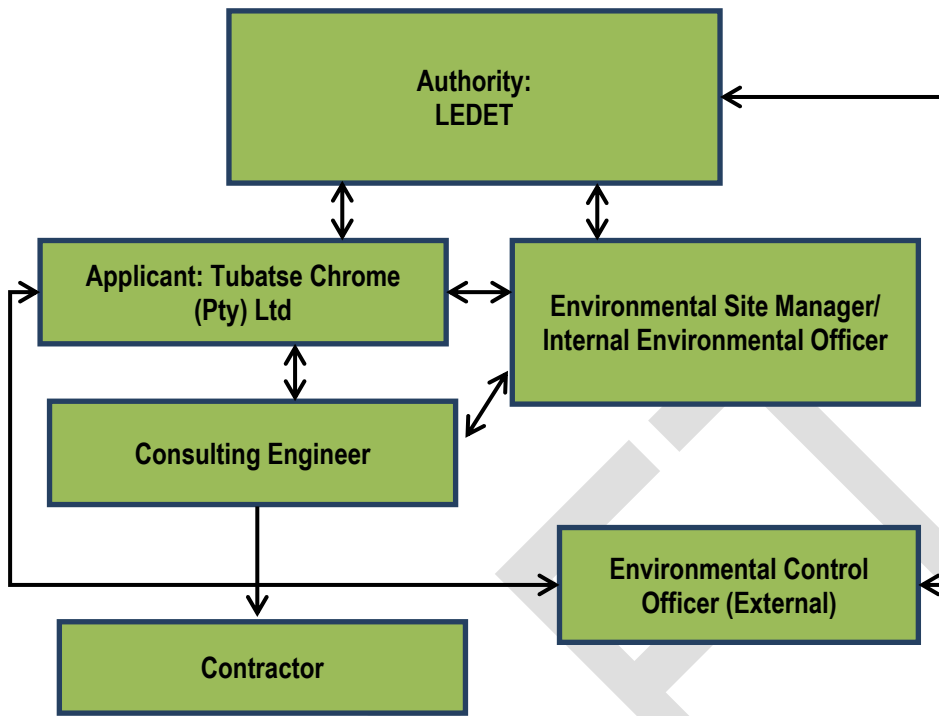




Figure 1: EMPr Organisational Structure

Table 5: Roles and Responsibilities

ROLE-PLAYER	RESPONSIBILITIES
<p>Authority</p>	<p>LEDET is the designated authority responsible for authorising the EMPr and has the overall responsibility for ensuring that the Applicant complies with the conditions of the Environmental Authorisation (EA) and the EMPr. LEDET shall also be responsible for approving any amendments to the EMPr (if required). LEDET may perform random site inspections to confirm compliance with the EMPr.</p>
<p>Applicant</p>	<p>The Applicant is the Developer and has overall responsibility for compliance with the EMPr as it is a fundamental component of the authorisation requirements for the project. The Applicant must:</p> <ul style="list-style-type: none"> • Ensure that relevant authorisations and permits are obtained prior to the commencement of construction on-site; • Ensure compliance with the EMPr and conditions of Environmental Authorisation as issued by LEDET; • Appoint an ESM prior to the commencement of construction activities; • Ensure that there are sufficient resources (human resources, labour and finances) to manage and monitor the environmental issues related to the siding processes, especially in terms of water resources; • Ensure that the professional team and the Contractors are appropriately briefed and that their appointment includes environmental requirements as relevant; • Ensure that he/she is kept fully informed of the performance of the project against the requirements of the EMPr; • Ensure that appropriate action is taken where consistent incidents of non-compliance is taking place; • Ensure that any corrective action required by the Authorities is implemented; • Ensure that any proposed changes to the EMPr are communicated in writing to the Authorities for approval; • Give written notice to LEDET 14 days (or as specified in the EA) prior to the commencement of construction on-site; and • Provide all Contractors with a copy / access to the EMPr (as part of the tender contract documentation). A hardcopy of the following documents shall also be kept on-site to access at all times: <ul style="list-style-type: none"> - EMPr; - Monitoring Programmes; - EA;

ROLE-PLAYER	RESPONSIBILITIES		
	<ul style="list-style-type: none"> - BAR; - SDS; - Method Statements; - Complaints Register; - Audit Reports, etc. 		
Contractor	<p>The Contractor is required to:</p> <ul style="list-style-type: none"> • Prepare site specific Method Statements in line with the EMPr (as required); • Be conversant with the requirements of the EMPr; • Brief staff about the requirements of the EMPr • Comply with requirements of the Engineering Representative (ER) in terms of this EMPr; • Bear the costs of any damages / compensation resulting from non-adherence to the EMPr or written site instructions (as specified in the contractor agreement); • Comply with all applicable legislation; • Keep records of any complaints raised by the public and record any actions taken to address complaints; • Inform the ESM and ECO of any incidents or complaints received; • Ensure that the Applicant is timeously informed of any foreseeable activities that will require input from the ER; and • The Contractor will conduct all activities in a manner that minimizes disturbances to and impacts on the environment. <p>The Contractor is deemed not to have complied with this EMPr if:</p> <ul style="list-style-type: none"> • There is evidence of contravention of clauses within the boundaries of the property and adjacent areas; • If environmental damage ensues due to negligence; • The Contractor fails to comply with corrective or other instructions issued by the Local Authority, Engineer, ER, ECO, or the Applicant within a specified time; • Failure to take any reasonable measure to protect the environment if there is a perceived or identified environmental risk associated with an activity that has not been defined in the EMPr; and • The Contractor fails to respond adequately to complaints from the public. 		
Environmental Site Manager (Internal Environmental Officer)	<p>The responsibilities of the ESM include the following:</p> <ul style="list-style-type: none"> • Facilitation and monitoring (weekly) of EMPr requirements and EA conditions; 		
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ROLE-PLAYER	RESPONSIBILITIES		
	<ul style="list-style-type: none"> • Act as a guide to the construction team and staff working on-site during all phases of the development including preparation, construction, operational, decommissioning and rehabilitation; • Education of staff and contractors and to raise awareness on environmental requirements relating to the site and onsite activities; • Review and approval of Method Statements; • Record keeping of environmental incidents / issues on-site and how it has been addressed; • Upkeep of complaints register; • Ensure that all environmental incidents reported are dealt with timeously and effectively; • Completing start-up and site closure checklists; • Completing a monthly summary report detailing levels of compliance to be forwarded to the project team and case officer at LEDET; and • Keeping a photographic record of progress on-site from an environmental perspective for the ECO (external). 		
Consulting Engineer	<p>The Consulting Engineer runs the works contract and has overall responsibility for managing the project engineering aspects, Contractors, and for ensuring that the environmental management requirements are met.</p>		
External Environmental Control Officer	<ul style="list-style-type: none"> • Facilitation and monitoring of EMP requirements and EA conditions; • Keeping a photographic record of progress on-site from an environmental perspective. Conduct regular site visits (monthly or as stipulated in the EA) during the construction phase to be able to report and respond to any environmental issues; • Report compliance and non-compliance issues to the Competent Authority as applicable; • Advise the Contractor on environmental issues within the defined work areas; • Review access and incidents records that may pertain to the environment and reconcile the entries with the observations made during site inspection, monitoring and auditing; • Recommend corrective actions when required for aspects of non-compliance with the EMP; • Take immediate action on-site where clearly defined and agreed “No-Go” areas are violated or in danger of being violated and to inform the Tubatse Chrome (Pty) Ltd representative of the occurrence immediately to take action; • Be contactable by the public regarding matters of environmental concern as they relate to the operation of the works; and • Compile monthly audit reports for submission to the Competent Authority as per the EA conditions. 		
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6. PROPOSED ACTIVITY

Tubatse Chrome (Pty) Ltd (hereinafter referred to as Tubatse Chrome), has an existing Pelletising and Sintering Plant (PSP), constructed in 2000, for which an Environmental Authorisation was obtained (Ref No. 16.4.28.50L1). In 2010 the Plant was upgraded, after Tubatse Chrome obtained an Environmental Authorisation for the upgrade (Ref No. 12/1/9-6/25-GS2). Tubatse Chrome currently, has a Liquefied Petroleum Gas (LPG) tanks installed at the PSP with a combined capacity of 45 m³. Tubatse Chrome is authorised under an Air Emissions License (AEL) (Ref. No. 12/4/12L-s4/A1), to consume 1 620 tons per annum of LPG.

Tubatse Chrome now intends to expand the fuel storage capacity by installing an additional 46 m³ tank that will contain Light Straight-run Naphtha (LSR). The combined capacity of “dangerous goods” stored at the PSP will, therefore, be 91 m³. Naphtha is listed in SANS 10228 as a “dangerous good”. The LSR gas will supplement the consumption on the existing LPG fuelled system and alleviate the high cost associated with LPG usage.

Tubatse Chrome has two existing access points on the site i.e. the main entrance and the heavy duty gate. The applicant obtained a Water Use License (WUL) for the use of water by abstracting water from boreholes for use in the plant.

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Samancor Ltd. Tubatse Chrome Smelter, Steelpoort, Limpopo - Regional Locality Map

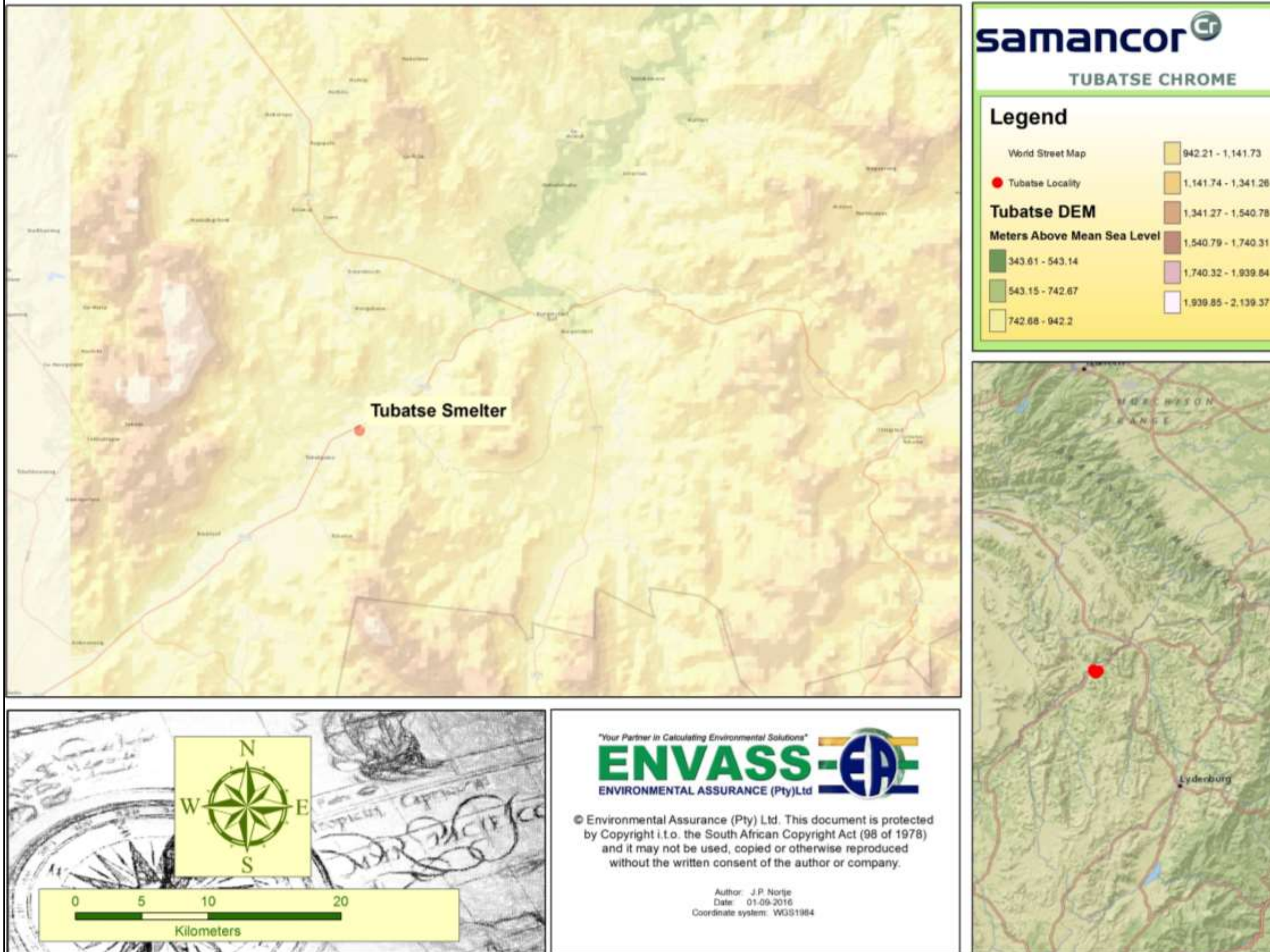
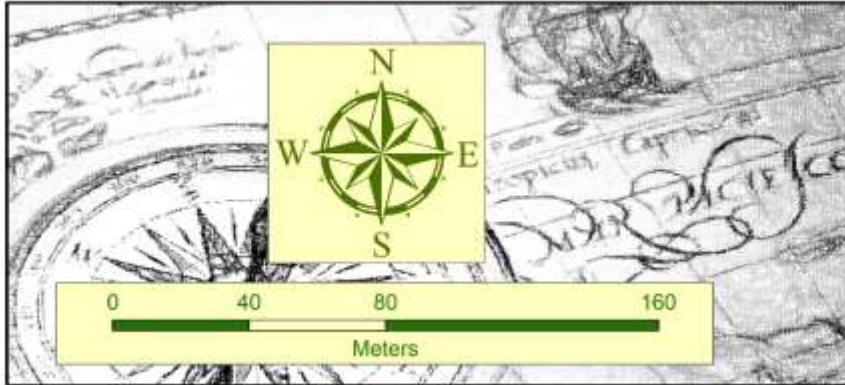


Figure 2: Regional Locality Map

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Proposed LSR Tank Placement at Tubatse Chrome, Limpopo Province, South Africa



"Your Partner in Calculating Environmental Solutions"

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Author: L. Taylor
Date: 21-01-2018
Coordinate system: WGS1984

Legend

- ◆ LSR Tank
- ◆ LSR Tank Alternative
- ◆ Existing LPG Gas Tanks

Figure 3: Aerial Photograph Locality Map

7. DESCRIPTION OF THE BASELINE ENVIRONMENT

7.1 Location and Land Use

The Tubatse Chrome PSP is located approximately 1 km west of the centre of the Steelpoort town. The Steelpoort River is located a 1 km to the north of the study area, running from the south-west, towards the north-east. A rezoned industrial site, Ngululu Bulk Carriers, is located within 1 km to the west of the plant, including a small residential village for Ngululu Bulk Carriers employees. The plant is surrounded by informal settlements and rural communities to the north of the Steelpoort River and agricultural lands and activities taking place approximately 5 km to the south-east (refer to Figure 2 for an aerial photograph and Figure 3 for a map of the surrounding land uses. Figure 4, indicates the sensitivities on and surrounding the study area.

7.2 Topography


The area is undulating, sloping gently away from the mountain.

7.3 Geology and Soils

The study area falls in the eastern limb of the Bushveld Igneous Complex and is part of the Critical Zone of the Rustenburg Layered Suite. The Critical Zone is divided into the Upper and Lower Critical Zone, characterised by the Winterveld norite and anorthosite and the Mooihoek pyroxenite respectively. While 13 chromite layers occur in both zones, the 1m thick LG 6 chromite layer in the Mooihoek pyroxenites is the most significant and mined by Samancor Eastern Chrome Mines (ECM) (Steelpoort), along its strike. The mafic rocks are covered by a variable thickness of topsoil and colluvium (hillwash) with increasing thickness towards the foothills of the mountains. The weathered material is replaced or overlain along the river courses by alluvial deposits. The deposits form especially along the Steelpoort River a high yielding alluvial aquifer along the river course, often targeted for water supply purposes (Delta H Water Systems Modelling, 2014). The mafic rocks (pyroxenite, norite and anorthosite) of the Rustenburg Layered Suite of the Bushveld Igneous Complex (BIC), within which the study area is located, is overlain by a weathered material, hillwash and alluvial deposits (Delta H Water Systems Modelling, 2014).

7.4 Surface Water

The project area falls within the B41J quaternary catchment area within Water Management Area (WMA) 2, which is known as the Olifants WMA. The boundary of the WMA is Primary drainage region B. Major rivers include the Elands, Wilge, Steelpoort, Olifants and Letaba. The Olifants River originates to the east of Johannesburg and initially flows northwards before gently curving eastwards towards the Kruger National Park (KNP), where it is joined by the Letaba River before flowing into Mozambique. The Olifants WMA, covers an area of 54, 570 km². The Olifants catchment is divided into three management areas namely the Upper, Middle and Lower Olifants management zone. The Upper Olifants Sub-area is the most urbanised of the four sub-areas with the majority of the urban population located in Witbank and Middelburg. The

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population in these urban centres is projected to grow in the future. There are extensive coal mining activities in the sub-area both for export through Richards Bay and for use in the 6 active coal fired power stations in the sub-area. The presence of coal also led to the establishment of the steel manufacturing industries located in Middelburg and Witbank.

The surface water in the Steelpoort area consists of several non-perennial tributaries of the Steelpoort and Moopetsi Rivers, both feeding the perennial Olifants River. The site falls within the Olifants primary drainage region, lying in the lower reaches of the B41J quaternary catchment. The surface water uses in the area comprises mainly of agricultural activities (informal irrigation, livestock watering), informal domestic use (washing of clothes and dishes), recreational use (swimming) and mining activities in addition to the Ecological Reserve.


7.5 Biodiversity

In terms of ecological importance this area forms part of the Eastern Bankenveld eco and aquatic region. As can be seen in Figure 2, the predominant land uses are mining (Silica), semi-urban residential areas (informal and formal settlements), and agriculture (grazing). The land has been significantly disturbed by agriculture, urban sprawl and industrial and mining activities.

According to the delineation provided by Dallas (2005), the area is situated within the **Bushveld Bioregion**. Kleynhans *et al.* (2005) classifies the area as the **Eastern Bankenveld Level 1 Ecoregion** and describes the bushveld bioregion as consisting predominantly of plains with a low relief and with Mixed Bushveld being the definitive vegetation type. In the east, plains and lowlands with a moderate relief occur (Nortje, 2017).

Two vegetation types are located in close proximity to the study area i.e Sekhukhune Mountain Bushveld and Sekhukhune Plains Bushveld (SANBI, 2017). Characteristics of the Sekhukhune Mountain Bushveld type include:

- Dry, open to closed microphyllous and broad-leaved savanna on hills and mountain slopes that form concentric belts parallel to the northeastern escarpment;
- Open bushveld often associated with ultramafic soils on southern aspects;
- Bushveld on ultramafic soils contain a high diversity of edaphic specialists;
- Bushveld of mountain slopes generally taller than in the valleys, with a well-developed herb layer;
- Bushveld of valleys and dry northern aspects usually dense, like thicket, with a herb layer comprising many short-lived perennials;
- Dry habitats contain a number of species with xerophytic adaptations, such as succulence and underground storage organs;
- Both man-made and natural erosion dongas occur on footslopes of clays rich in heavy metals; and
- An increasing area along the Dwars River Subsite is under pressure from mining activities and its associated urbanisation.

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The Sekhukhune Plains Bushveld Vegetation Type has the following characteristics:

- It occurs mainly on semi-arid plains and open valleys between chains of hills and small mountains running parallel to the escarpment;
- Predominantly consists of short, open to close thornveld with an abundance of Aloe species and other succulents;
- Heavily degraded in places and overexploited by man for cultivation, mining and urbanization;
- Both man-made and natural erosion dongas occur in areas containing clays rich in heavy metals;
- Encroachment by indigenous microphyllous trees and invasion by alien species is common throughout the area;
- There is a high level of degradation of much of the remaining vegetation by unsustainable harvesting and utilization;
- Soils are shallow, gravel lithosols of the Mispah and Glenrosa forms (South African National Biodiversity Institute (SANBI) and Mucina & Rutherford (2006)).

Due to the small surface area and severe habitat degradation of the study unit, very little faunal species diversity was observed on the day of the assessment. The area of concern simply doesn't have the correct attributes to successfully house a variety of animal species. Although there are intact floral units left on site, the area is too fragmented by roads and other developments to allow free species migration similar to that of the surrounding environment.

Due to the severely degraded state of the study area only limited fauna was found on site – of these, the majority was avifauna.


From all the biodiversity assessments undertaken by the specialist (Nortje, 2017), it was clear that the study area is not deemed sensitive. Care must however be taken to reduce impacts on the adjacent properties through the implementation of all the mitigation measures proposed by the specialists. Due to the severe degradation encountered in the area no long-term impacts on the ecology can be foreseen.

7.6 Cultural Heritage

No significant archaeological or historical features have been observed on the study areas.

7.7 Socio-economic


The Fetakgomo- Greater Tubatse Local Municipality (hereinafter referred to as FGTLM). The FGTLM is located within the Sekhukhune District Municipality (SDM) of the Limpopo Province. The FGTLM is categorised as a category B4 municipality. This is defined in the 'State of Local Government in South Africa: Overview Report, the Department of Cooperative Governance (CoG) (2009:22) as municipalities which are mainly rural, located in economically depressed areas, consequently having difficulties in attracting and retaining skilled managers/professionals and are struggling from a revenue generation perspective. The political governance of the Municipality is operated on a collective executive system combined with a ward participatory system. According to the Provincial Gazette no 2735 s12 Notice, its short title: "Notice in terms of s12 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998): Disestablishment of Existing Municipalities

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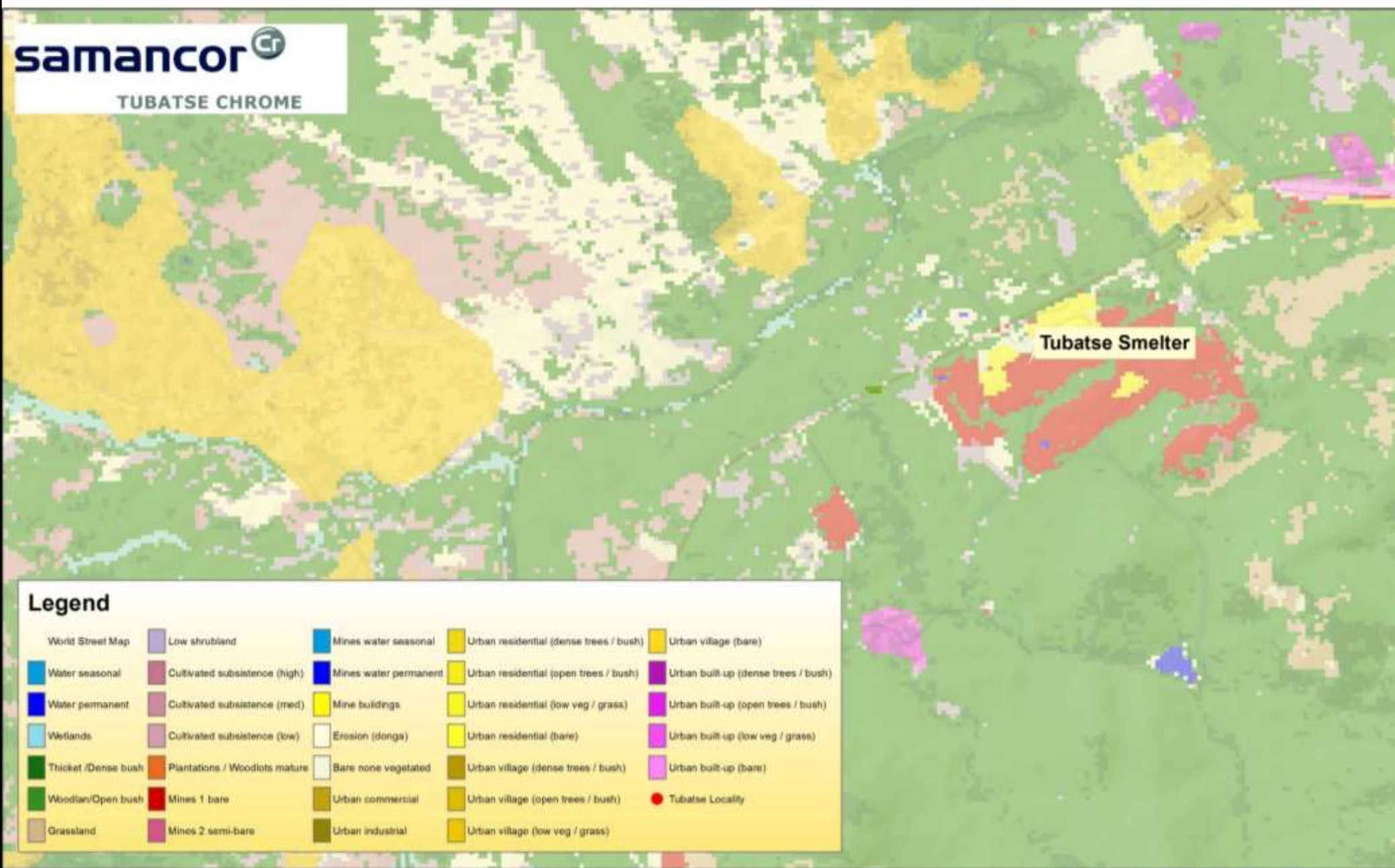
and Establishment of New Municipalities”, dated 22 July 2016, LIM476 government municipality has a total of 39 wards. The FGTM is the third largest municipality in the Limpopo Province in terms of wards, after Polokwane with 45 wards and Thulamela with 41 wards (FGTLM, 2017).

The municipality share borders with Makhuduthamaga Local Municipality in the Sekhukhune District, Lepelle Nkumpi Local Municipality in the Capricorn District Municipality and Thabachweu Local Municipality in the Ehlanzeni District Municipality of the Mpumalanga Province and Maruleng Local Municipality in Mopani District. The Municipality has a total population of 490 381 people (Statistics South Africa Community Survey, 2016). The population in the borders of the Municipality is growing rapidly with the makeup of more females 251 923 (51%) than males 238 458 (49%). Of the 490 381 total population, 223 214 are young people. The youth represents 46% of the local population (FGTLM, 2017).

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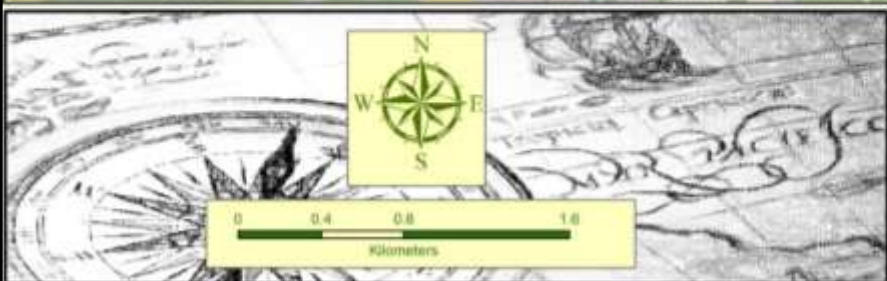
Samancor Ltd. Tubatse Chrome Smelter, Steelpoort, Limpopo - Land Cover Map



Tubatse Smelter

Legend

World Street Map	Low shrubland	Mines water seasonal	Urban residential (dense trees / bush)	Urban village (bare)
Water seasonal	Cultivated subsistence (high)	Mines water permanent	Urban residential (open trees / bush)	Urban built-up (dense trees / bush)
Water permanent	Cultivated subsistence (med)	Mine buildings	Urban residential (low veg / grass)	Urban built-up (open trees / bush)
Wetlands	Cultivated subsistence (low)	Erosion (donga)	Urban residential (bare)	Urban built-up (low veg / grass)
Thicket /Dense bush	Plantations / Woodlots mature	Bare none vegetated	Urban village (dense trees / bush)	Urban built-up (bare)
Woodlan/Open bush	Mines 1 bare	Urban commercial	Urban village (open trees / bush)	Urban built-up (bare)
Grassland	Mines 2 semi-bare	Urban industrial	Urban village (low veg / grass)	Tubatse Locality




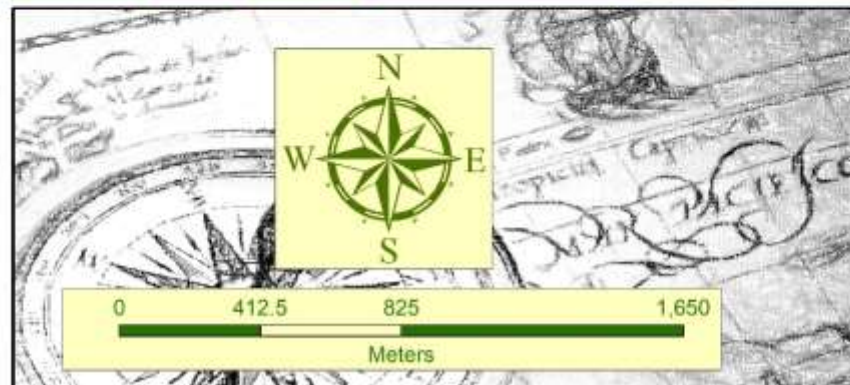
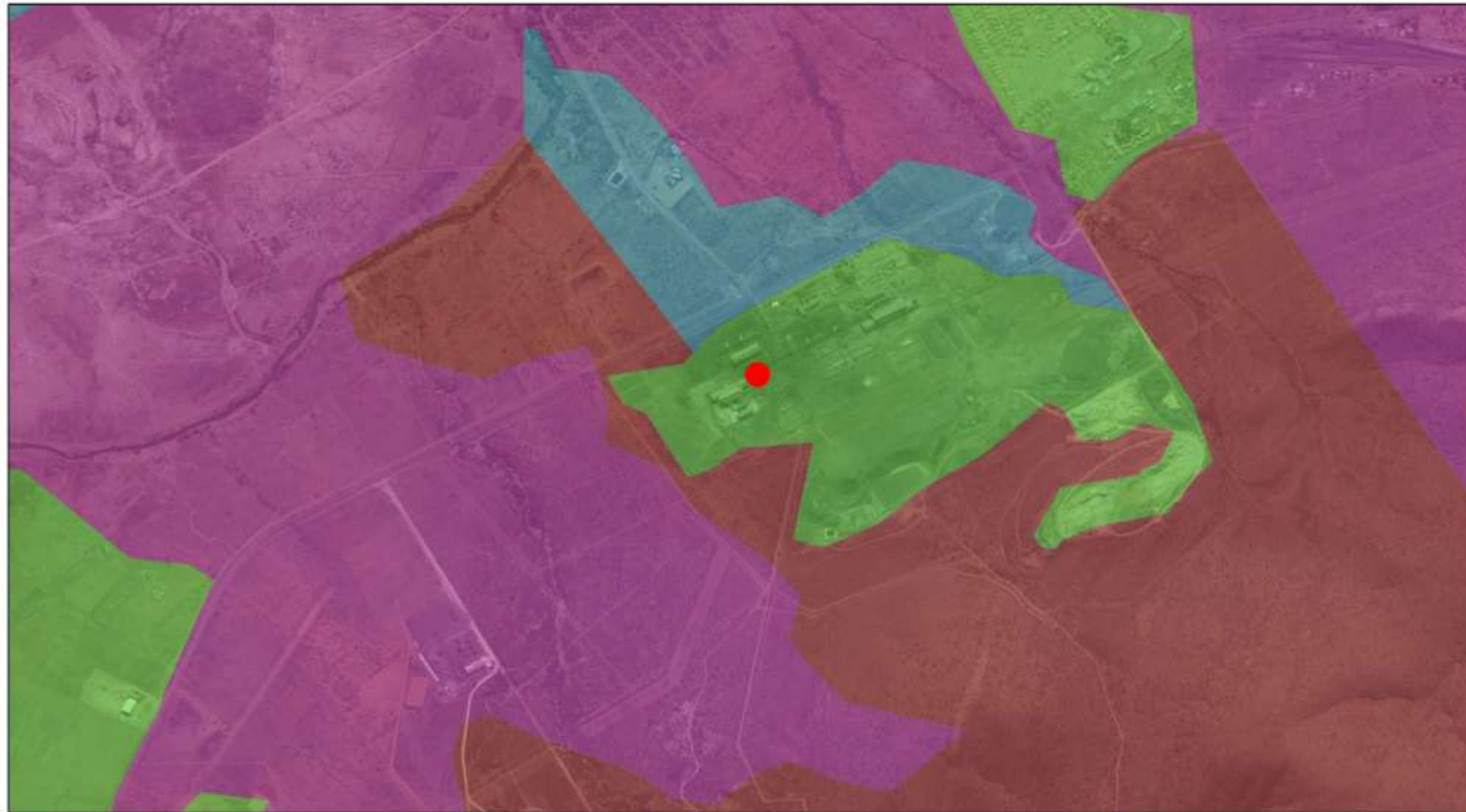

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 Author: J.P. Nortje
 Date: 01-09-2016
 Coordinate system: WGS1984




Figure 4: Land Use Map

Conservation Status of the Tubatse Chrome Operations, Limpopo Province, South Africa



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Author: L. Taylor
 Date: 21-01-2018
 Coordinate system: WGS1984

Legend

-  Tubatse Chrome

Limpopo Conservation Plan


-  Critical Biodiversity Area 1, CBA1
-  Critical Biodiversity Area 2, CBA2
-  Ecological Support Area 1, ESA1
-  Ecological Support Area 2, ESA2

Figure 5: Sensitivity Map

8. ENVIRONMENTAL MANAGEMENT PROGRAMME

8.1 Construction Phase Mitigation and Management Measures

Table 6: Construction Phase Management Measures

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>Contamination of soils through:</p> <ul style="list-style-type: none"> ○ Indiscriminate disposal of waste; and ○ Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g. paints. 	<ul style="list-style-type: none"> • Prevent and or minimise impact to soil, groundwater and surface water that may occur. • Minimise pollution of the surface water resources through effective prevention measures. • Ensure that the surface water run-off quality does not impact on the area and receiving environment. 	<p>Erosion Control:</p> <ul style="list-style-type: none"> • The contractor must ensure that all reasonable measures are taken to limit erosion and sedimentation from the installation of the tank and activities associated therewith. Erosion protection measures include cut-off drains and/or berms to be maintained. <p>Soil Pollution Prevention:</p> <ul style="list-style-type: none"> • Correct waste management measures are to be implemented for the site. No dumping of any kind of waste (general, construction, hazardous waste, sewage etc.) will take place on site; • Proper handling, storage and disposal of hazardous chemicals; 	<p>During the construction phase</p>	<p>Contractor / Environmental Site Manager (ESM)</p>	<p>Stormwater Management Plan; Records of vehicle maintenance; Spill procedure; Environmental Policy; Incident register; Waste procedure.</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>Contamination of stormwater runoff and groundwater, caused by:</p> <ul style="list-style-type: none"> ○ Erosion; ○ Sediment release; ○ Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; ○ Improper handling, storage and disposal of substances and hazardous chemicals; ○ Incorrect waste management; ○ Effluent discharges and seepage, due to a lack of stormwater management; 	<ul style="list-style-type: none"> ● Reduce erosion and contamination of surface water by effective stormwater control. ● Preventing or minimising the potential pollution of surface water as a result of incorrect waste management. ● Preventing or minimising the potential of surface water pollution as a result of improper handling, storage and disposal of harmful substances and hazardous chemicals. ● Preventing or minimising the potential pollution of surface 	<ul style="list-style-type: none"> ● Sufficient ablution facilities must be provided and maintained during the construction phase. <p>Fuel Storage</p> <ul style="list-style-type: none"> ● Topsoil and subsoil will be protected from contamination; ● Fuel and other hydrocarbon material must be stored in designated areas; ● Any storage tanks containing hazardous materials must be placed in bunded areas with impermeable surfaces. The bund walls must be able to contain 110% of the total volume of the stored hazardous material; ● Vehicles and equipment requiring fuel should preferably be re-fuelled offsite or if onsite, in a demarcated area on an impermeable surface. Drip-trays must be used to prevent soil and water pollution; ● Contaminated soil must be contained and disposed of at a registered landfill site; ● The latest edition of the South African National Standard Globally harmonised System of the Classification and Labelling of Chemicals (GHS) must be adhered to; 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>○ Pollutants from hazardous production waste and general waste generated on site.</p>	<p>water as a result of insufficient and poorly maintained ablution facilities.</p> <ul style="list-style-type: none"> • Preventing or minimising the potential pollution of surface water as a result of increased traffic frequency. • In accordance with Government Notice 704 (GN 704), the onsite management should: <ul style="list-style-type: none"> ▪ Keep clean and dirty water separated; ▪ Contain any dirty water within a system; and 	<p>Sanitation</p> <ul style="list-style-type: none"> • The site is in close proximity to the existing ablution facilities of the operation. Sanitary arrangements should be to the satisfaction of the ECO, ESM and the local authority. The toilets and other ablution facilities must be kept in a clean, neat and hygienic condition. Toilet paper and dispensers must be supplied at all toilets at all times; • Toilets must be easily accessible and a maximum of 50 m from the Works area where possible to ensure they are utilised; <p>Stormwater:</p> <ul style="list-style-type: none"> • Should any signs of erosion be found, remedial action such as backfilling, compaction and re-vegetation must be taken immediately to avoid exacerbation of the erosion; • Stormwater must be channelled away from any exposed areas for the duration of the operational phase; • All stormwater infrastructure on site must be maintained and kept clean throughout the construction period; 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<ul style="list-style-type: none"> Prevent the contamination of clean water. 	<ul style="list-style-type: none"> No wastewater may run freely into any of the surrounding naturally vegetated areas. Runoff containing high sediment loads must not be released into natural or municipal drainage systems or nearby watercourses; Impediments to or blockage of natural water flow must be avoided wherever possible; All stormwater that would naturally run across any pollution areas must be diverted via channels and trapezoidal drains designed to contain the 1:50 year flood; Any surface runoff generated which has a high suspended solid content will be collected at the point source in an appropriate containment facility, then be allowed to settle before discharged into the environment; All water discharged to the environment must first be cleared of hydro-carbons and subsequent release into the environment must be within the allowable limits as per DWS General Limits. <p>Solid Waste and Waste Water Management:</p>			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> • Dumping of any excess rubble, building material or refuse is prohibited within the footprint of the site; • Liquid hazardous waste must be contained and stored according to the following measures: <ul style="list-style-type: none"> ▪ Storage and classification of hazardous waste to be in accordance with the waste classification and management regulations GNR 634-635; ▪ A designated skip for all hazardous waste must be made available on site. Skips must also be closed - no rain water to enter the skips; and ▪ All drip trays / bunds / other temporary storage containers must be inspected for freeboard after rain and appropriate spill kits used to remove content; <p>Spillages:</p> <ul style="list-style-type: none"> • Stationary heavy vehicles and equipment must utilise drip trays and ground sheets to prevent spillage and contamination of the soil and run-off; • In the event of pollution caused as a result of construction activities, the Contractor, according to Section 20 of the National Water Act, 1998 (Act No. 36 of 1998) [as 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<p>amended] will be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas;</p> <ul style="list-style-type: none"> • Immediate reporting of any polluting or potentially polluting incidents to ensure appropriate measures are implemented; • Fuel and oil spills must be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site; • In case of any spillage, the ECO must be informed in order for him/her to investigate the incident and recommend appropriate mitigation measures; • Measures must be implemented to prevent a recurrence of a spillage event; • Bunds or traps to ensure full containment of hydrocarbon and other hazardous materials must be used. • Ensure that all contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited. 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> • Exposed surfaces must be kept to a minimum to decrease the volume of dirty run-off generated; • Site operators and designated staff must be trained to supervise the response to spill incidents. <p>General</p> <ul style="list-style-type: none"> • Good housekeeping and management principles must be implemented; • Minimise the spatial footprint of the development to the greatest degree possible; • Make use of existing infrastructure such as roads, bridges and servitudes so as to minimise impacts; • Education on this impact must be included in the Environmental Awareness training content provided to workers. 			
Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts		<ul style="list-style-type: none"> • Construction site yards, concrete batching plants (if required) and other noise fixed facilities should be located well away from the external noise sensitive areas and office areas within the Plant area itself; 	Throughout the construction phase	Contractor Applicant / ESM	Vehicle and machinery maintenance schedules and

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>associated with the construction vehicles and equipment and activities.</p> <p>Disturbance due to vibrations caused by heavy vehicles.</p>		<ul style="list-style-type: none"> All construction vehicles and equipment are to be kept in good repair; In general, operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993); and Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA should wear hearing protection equipment. 			records up to date
<p>Fugitive dust emissions: Vehicle entrainment of dust from paved roads.</p> <p>On entering the TFC site, trucks delivering raw materials for use at the pelletising plant travel on a section of paved road of approximately 400 m in length. These trucks have an average pay load of 28 tons and an average weight of 33</p>	<ul style="list-style-type: none"> To prevent and minimise the visual impact associated with dust emissions; To prevent and minimise the impact on air quality; To prevent and minimise health impacts from dust emissions on visitors and workers as well as the surrounding population; 	<ul style="list-style-type: none"> Water tankers must be utilised for dust suppression on roads. Have standby equipment available should equipment fail; Undertake regular monitoring of air quality and dust fall; Maintain machinery and exhaust systems. 	<p>Construction Phase</p> <p>Monthly dust monitoring</p>	<p>Applicant, ECO / ESM</p> <p>Air quality monitoring specialist</p>	<p>Air Emissions License</p> <p>Dust / air quality monitoring reports</p> <p>Air quality monitoring programme</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>tons. Site specific particle size analysis determined the silt loading of the paved surface to be 307 g/m². The TFC entrance road is swept on a regular basis and a control efficiency of 75% were applied to emission calculations.</p>	<ul style="list-style-type: none"> To prevent cumulative impacts of dust emissions in the area. 				
<p>Vehicle entrainment of dust from unpaved roads. Fuel will be delivered directly into the tanks A 25% silt content of the material on the surface of the unpaved road section was determined through site specific particle size analysis.</p>	<ul style="list-style-type: none"> To prevent and minimise the visual impact associated with dust emissions; To prevent and minimise the impact on air quality; To prevent and minimise health impacts from dust emissions on visitors and workers as well as 	<ul style="list-style-type: none"> Implement additional dust suppression measures such as “Rain Bird” water sprays if required; Have standby equipment available should equipment fail; Undertake regular monitoring of air quality and dust fall; Maintain machinery and exhaust systems. 	<p>Construction Phase Monthly dust monitoring</p>	<p>Applicant, ECO / ESM Air quality monitoring specialist</p>	<p>Air Emissions License Dust / air quality monitoring reports Air quality monitoring programme</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<p>the surrounding population;</p> <ul style="list-style-type: none"> To prevent cumulative impacts of dust emissions in the area. 				
<p>Generation of general waste, litter and building rubble and hazardous material during the construction phase may cause soil, water and air pollution and pose a human health risk.</p>	<ul style="list-style-type: none"> Prevent pollution; Minimise waste generation; Minimise disposal of waste; Dispose of waste safely; Separation of waste Comply with legislation; Key waste streams will be identified, characterised and classified and the collection, handling and disposal will be in accordance with the 	<ul style="list-style-type: none"> All waste generated during construction must be managed in accordance with the requirements of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) [as amended] Waste Classification and Management Regulations, 2013 (GNR: 634 – 635): <p>Waste Stream Identification and Classification:</p> <ul style="list-style-type: none"> All waste generated must be classified into separate waste streams (i.e. general waste, hazardous waste and recyclables); Waste must not be mixed prior to classification and all waste types generated must be kept separate; Classification of any hazardous waste must be done in accordance with SANS 10234 requirements; Safety data sheets must be kept for any hazardous waste in accordance with SANS 10234 requirements; 	<p>During the construction phase</p> <p>Wheelie bins to be emptied into designated skips a minimum of once weekly.</p> <p>Waste to be removed as soon as capacity of waste skips is reached or</p>	<p>Contractor / Environmental Site Manager (ESM)</p> <p>ECO</p>	<p>Waste management procedure</p> <p>Disposal certificates</p> <p>Contracts with waste removal contractors.</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<p>respective waste stream classification and legislation;</p> <ul style="list-style-type: none"> To ensure that waste, in particular hazardous waste can be affectively controlled from generation until it is safely disposed. Waste must be considered as hazardous where there is any doubt about potential danger to the environment; To ensure that hazardous waste is separated from other waste, to be handled in a 	<ul style="list-style-type: none"> Safety sheets must be prepared in accordance with SANS 10234 for the product that the waste originates from; Safety sheets must be prepared in accordance with SANS 10234 reflecting the details of the specific hazardous waste/s or hazardous chemicals in the waste; and All safety data sheets must be kept on file on the construction site. <p>Waste Management (collection, storage and handling):</p> <ul style="list-style-type: none"> A central waste storage and transition area must be established within the site camp; The location of this central waste storage and transition area must be decided upon by the ESM and ECO (external); The central waste storage and transition area must be surfaced and demarcated appropriately; Portable wheelie bins must be placed throughout the site camp as well as at the remainder of the site and at all working areas in the field; 	when 30 days is reached.		

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<p>correct and responsible way.</p> <ul style="list-style-type: none"> • The volumes and rates of the respective waste streams generated will be recorded to contribute to the effective management of these streams; • Opportunities for waste reduction, reuse, recycling and recovering will be regularly investigated and feasible opportunities implemented as part of the continual improvement philosophy adopted for the proposed development; 	<ul style="list-style-type: none"> • Wheelie bins must be colour coded and labelled to identify the waste stream for which it is intended; <ul style="list-style-type: none"> ▪ Signs with English wording. ▪ Full descriptions of the waste are required to assist site and external personnel to handle the material safely. ▪ Any unidentified wastes will be treated initially as hazardous and will be subject to the classification process outlined above. ▪ All waste containers on-site (bins, skips, drums, etc.) will be clearly labelled to show which wastes can be disposed into them and which wastes they contain. ▪ Any previous labelling will be removed or covered to avoid confusion. • All portable wheelie bins and other containers must be emptied at the central waste storage and transition area a minimum of once a week as to avoid waste build up; • The waste must be removed (within 30 days) by a licensed waste removal contractor and disposed of at a licensed waste landfill site. Records of safe disposal (as 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<ul style="list-style-type: none"> Concerted effort will be made to ensure rehabilitation in accordance with best practice measures Ensure that recyclable materials do not get contaminated with hazardous materials, which will render it unsuitable for recycling. Ad hoc treatment of waste generated occasionally reduces the number of bins required, while ensuring maximum benefit from disposing of waste with a market value; 	<p>required for hazardous waste) must be supplied to the Contractor. These records must be kept on site by the ESM.</p> <p>Waste Specific Management Measures: <u>Hydrocarbons and Hazardous Waste</u></p> <ul style="list-style-type: none"> All hazardous waste generated must be kept separate and not be mixed with general waste; All hazardous waste shall be stored within a lidded drum on an impermeable surfaced area within the central waste storage and transition area; All hazardous waste must have material safety data sheets and such waste shall be disposed of as per the product Material Safety Data Sheet (MSDS); Hazardous waste must be collected by a licensed waste service provider and be disposed of at a licensed landfill site with certificates of safe disposal; Certificates of safe disposal must be acquired from the service provider for record purposes and these must be maintained by the ESM on site; 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<ul style="list-style-type: none"> • Ensure that bins are correctly identified and that waste are correctly disposed of. Waste sorting must be followed by recycling as part of the waste minimisation process; • Ensure responsible disposal of waste; • Allow for timely information, control, auditing and follow-up if needed; • Allow for proper administration and control and to ensure correct waste is loaded and to prevent theft; and 	<ul style="list-style-type: none"> • All containers (skips) within the central waste storage/ transition area must be labelled, or where labelling is not possible, records must be kept, reflecting the following: <ul style="list-style-type: none"> ▪ Date on which waste was first placed in the container; ▪ Date on which waste was placed in the container for the last time and when the container was filled, closed, sealed or covered; ▪ Dates when, and quantities of waste removed; ▪ Proof of safe disposal by licensed contractor must be kept by the ESM. <p><u>Scrap metal</u></p> <ul style="list-style-type: none"> • Steel and any other scrap metals are to be collected and stored within the central waste storage/ transition area within a skip or other suitable container; • Scrap metal material must be collected by a licensed waste management company and taken to an approved and licensed local recycling company / scrap metal dealership; and 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<ul style="list-style-type: none"> • Special attention must be given to the following waste that could be generated on site and their disposal: <ul style="list-style-type: none"> ▪ Asbestos ▪ Waste tyres ▪ Empty explosive containers ▪ Medical waste • Used oil 	<ul style="list-style-type: none"> • Documentary proof of delivery to the recycling facility will be maintained on site by the ESM. <p><u>Timber</u></p> <ul style="list-style-type: none"> • Timber generated will be collected and stored within the central waste storage/ transition area; • The timber shall be kept free of any water (rain) and other hazardous leachate; • The timber shall be collected and transported to a designated waste / recycle site; and • Documentary proof of delivery to the recycling facility will be maintained on site by the ESM. <p><u>Building Rubble</u></p> <ul style="list-style-type: none"> • The ESM must ensure that the entire site (including the site camp/ contractor's laydown area and any other working area) is cleaned of waste at least once a week; and • Clean rubble* must be temporarily stockpiled in a waste skip / central stockpile (away from any drainage / sensitive areas) and used as a base course material or 			


Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<p>removed from site to a crusher plant or licensed landfill site;</p> <p><i>*No plastics, shrink wrap, paint buckets or any other debris that does not constitute clean building rubble, shall be stored at such stockpile sites.</i></p> <p><u>Domestic Waste</u></p> <ul style="list-style-type: none"> • The ESM must ensure that the contractor's camp and eating areas are cleaned daily; • All domestic waste generated shall be disposed of into bins; • Bins must be provided at all eating areas; • Bins must be emptied once a week or when capacity is reached; and • No staff shall be allowed to deposit waste / litter anywhere on the site except into the bins provided. <p><u>Medical Waste</u></p> <ul style="list-style-type: none"> • Any medical waste generated on site must be appropriately stored; and • Medical waste must be collected by a licensed waste service provider and be disposed of at a licensed landfill 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<p>site with certificates of safe disposal to be kept onsite by the ESM.</p> <p><u>Waste Water</u></p> <ul style="list-style-type: none"> • Discharge of any waste water directly into the environment must be prevented at all times; • Waste water from toilets, kitchen facilities etc. must be pumped into a conservancy tank and temporary stored for removal and safe disposal by an accredited contractor; and • Records of removal and safe disposal must be kept by the ESM. <p><u>Recyclables</u></p> <ul style="list-style-type: none"> • Wherever possible and practical, waste materials generated on site must be recycled; • Recyclable materials include the following: <ul style="list-style-type: none"> ▪ Paper / cardboard ▪ Metals ▪ Glass ▪ Plastic ▪ Timber 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> ▪ Clean rubble; • Separate containers (with appropriate colour coding) must be provided for recyclable materials. The Applicant must provide and maintain a method statement for “solid waste management”. The method statement should provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes; • Waste should be separated into recyclable and non-recyclable waste, as follows: <ul style="list-style-type: none"> ▪ Hazardous waste: including (but not limited to) old oil, paint, etc.; ▪ General waste: including (but not limited to) domestic waste; ▪ Reusable operational material; and • Recyclable waste should preferably be deposited in separate bins. The Contractor is advised that “Collect-a-Can” collect tins, including paint tins, chemical tins, etc. and “Consol” collect glass for recycling. 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
The change in traffic patterns as a result of heavy vehicles and other traffic entering and exiting the proposed development area on the surrounding road infrastructure and existing traffic.	<ul style="list-style-type: none"> To prevent nuisance and accidents to the surrounding land users; 	<ul style="list-style-type: none"> All vehicles (construction and private) movement must be controlled on site and all vehicles must remain on designated routes; During all stages of the construction phase, the Applicant will be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual. 	During the construction phase	Applicant / Contractor / Environmental Site Manager (ESM)	N/A
Access Control	<ul style="list-style-type: none"> To protect the safety of workers and visitors to the site. 	<ul style="list-style-type: none"> 24 hour access control 	At all times	Applicant	Visitor records
Possibility of construction activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners, visitors and workers.	<ul style="list-style-type: none"> Prevent veld fires and destruction of veld and animals as well as property and the resulting economic impact. 	<ul style="list-style-type: none"> No cooking will be done on site. Emergency Response Team (ERT) on site is available should there be an emergency such as a fire outbreak. The contractor on site must be provided with the ERT contact details and these contact details must be displayed on site. 	During the construction phase, especially during the dry season.	Applicant / ESM Contractor	Safety policy including fire-fighting and prevention measures.

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
Increased risk to public health and safety: Dangerous areas and activities poses health risks and possible loss of life to construction workers and visitors to the site.	<ul style="list-style-type: none"> To prevent injury and health impacts on the public and construction workers; To prevent nuisance and health and safety accidents to the surrounding land users; 	<ul style="list-style-type: none"> Toolbox talks/staff briefing sessions; Site workers training programme; Training in the use and handling of equipment; Regular health and safety audits must be conducted and documented; A health and safety control officer must monitor the implementation of the health and safety plan for the decommissioning phase: All personnel working for, or on behalf of, the contractor as well as all visitors are to be outfitted with the required PPE; Site and operational personnel are prohibited from sensitive environments as indicated on the sensitivity map; Ablution facilities and areas are to be clearly demarcated and clear signage to be erected; Ablution facilities must be maintained weekly and kept clean as well as be inspected for any leaks that could lead to water loss; 	Construction Phase Audits to be conducted as and when required by applicable legislation and guidelines and standards.	Applicant / Contractor / Environmental Site Manager (ESM) / Health and Safety Officer	Toolbox talks and staff briefing attendance registers; Training programme; Training certificates; Health and Safety Audit Reports.

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Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> Potable water points are to be clearly demarcated and maintained; Ensure potable water complies with the NWA general limit requirements for drinking water. If necessary, potable water must be treated prior to consumption. If no filtration system is available, the Applicant must supply all employees, Contractors and visitors with potable water (at least 2 litres daily); A health and safety plan in terms of the Occupational Health and Safety Act should be drawn up and implemented to ensure worker safety. 			
Security risks: Trespassing of workers on adjacent properties and possible crime e.g. poaching.	<ul style="list-style-type: none"> To protect the safety and interests of the surrounding community from potential crime and poaching. 	<ul style="list-style-type: none"> Unsocioable activities such as consumption or illegal selling of alcohol, drug use or selling within the site area are prohibited; Any persons found to be engaged in such activities shall have disciplinary and / or criminal action taken against them; No person shall enter the site unless authorised to do so by security personnel; 	Construction Phase	Applicant / Contractor / Environmental Site Manager (ESM) / Health and Safety Officer	Toolbox talks and staff briefing attendance registers; Training programme; Training certificates

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> Trespassing on private / commercial properties adjoining the site is forbidden; The site should be secured in order to reduce the opportunity for criminal activity in the locality; Fencing must be accompanied by signage indicating the site and contractors, emergency numbers, and good practice safety and security signs; No personnel, except for security staff, are allowed to stay/live on the site. Security staff is to be provided with accommodation and ablution facilities and communication equipment; and Visitors are to complete the site visitor diary as well as a brief induction. The site visitor diary is to be kept at the site camp by the ESM for record purposes. Induction must include an introduction to the site and project, the authorised and unauthorised accesses as well as good practice safety procedure. 			
Damage or destruction of existing infrastructure in the near vicinity of the proposed	<ul style="list-style-type: none"> To prevent damage to services infrastructure such as powerlines, 	<ul style="list-style-type: none"> Heavy vehicles should remain on designated roads and are not allowed to drive onto other areas; 	Construction Phase	Applicant / Contractor / Environmental	Toolbox talks and staff briefing

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
activities. Impacts on existing infrastructure, services and servitudes.	roads, bulk water supply and sewage pipes and resulting disruption of services.	<ul style="list-style-type: none"> Any incidents should be reported to the correct responsible person immediately and to the municipality / service provider. 		Site Manager (ESM) / Health and Safety Officer	attendance registers; Training programme; Training certificates
Socio-economic impact on farmers and surrounding land owners and users due to negative impacts on groundwater, dust pollution, noise pollution etc.	<ul style="list-style-type: none"> To prevent and minimise negative impact on farmers and surrounding landowners and occupiers. 	<ul style="list-style-type: none"> All the recommended mitigation measures within this EMPR, to be implemented. 	Construction Phase	Applicant / Contractor / ESM / ECO / Health and Safety Officer	Toolbox talks and staff briefing attendance registers; Training programme; Training certificates

8.2 Operational Phase Management Measures

Table 7: Operational Phase Management Measures

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>Contamination of soils through:</p> <ul style="list-style-type: none"> Indiscriminate disposal of waste; and Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from delivery vehicles and other chemicals. <p>Contamination of stormwater runoff and groundwater, caused by:</p> <ul style="list-style-type: none"> Erosion; Sediment release; Chemicals such as 	<ul style="list-style-type: none"> Minimise the pollution of soil through effective prevention measures; Ensure effective soil management practices; Prevent and or minimise impact to soil, groundwater and surface water that may occur. Minimise pollution of the surface water resources through effective prevention measures. Ensure that the surface water run-off quality 	<p>Erosion Control:</p> <ul style="list-style-type: none"> The applicant must ensure that all reasonable measures are taken to limit erosion and sedimentation from the installation of the tank and activities associated therewith. Erosion protection measures include cut-off drains and/or berms to be maintained. <p>Soil Pollution Prevention:</p> <ul style="list-style-type: none"> Correct waste management measures are to be implemented for the site. No dumping of any kind of waste (general, construction, hazardous waste, sewage etc.) will take place on site; Proper handling, storage and disposal of hazardous chemicals; <p>Fuel Storage</p> <ul style="list-style-type: none"> Topsoil and subsoil will be protected from contamination; Fuel and other hydrocarbon material must be stored in designated areas; 	During the operational phase	Applicant ESM	<p>Stormwater Management Plan;</p> <p>Records of vehicle maintenance;</p> <p>Spill procedure;</p> <p>Environmental Policy;</p> <p>Incident register;</p> <p>Waste procedure</p>


Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>hydrocarbon-based fuels and oils or lubricants spilled from delivery vehicles;</p> <ul style="list-style-type: none"> Improper handling, storage and disposal of substances and hazardous chemicals; Incorrect waste management; Effluent discharges and seepage, due to a lack of stormwater management; Pollutants from hazardous production and 	<p>does not impact on the area and receiving environment.</p> <ul style="list-style-type: none"> Reduce erosion and contamination of surface water by effective stormwater control. Preventing or minimising the potential pollution of surface water as a result of incorrect waste management. Preventing or minimising the potential of surface water pollution as a result of improper handling, storage and 	<ul style="list-style-type: none"> Any storage tanks containing hazardous materials must be placed in bunded areas with impermeable surfaces. The bund walls must be able to contain 110% of the total volume of the stored hazardous material; Vehicles and equipment requiring fuel should preferably be re-fuelled offsite or if onsite, in a demarcated area on an impermeable surface. Drip-trays must be used to prevent soil and water pollution; Contaminated soil must be contained and disposed of at a registered landfill site; The latest edition of the South African National Standard Globally harmonised System of the Classification and Labelling of Chemicals (GHS) must be adhered to; <p>Sanitation</p> <ul style="list-style-type: none"> Sanitary arrangements should be to the satisfaction of the ESM and the local authority. The toilets and other ablution facilities must be kept in a clean, neat and hygienic condition. Toilet paper and dispensers must be supplied at all toilets at all times; 			<p>Environmental Awareness training manual</p> <p>Training attendance registers</p> <p>Training certificates</p> <p>Toolbox talks topics</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>general waste generated on site.</p>	<p>disposal of harmful substances and hazardous chemicals.</p> <ul style="list-style-type: none"> Preventing or minimising the potential pollution of surface water as a result of insufficient and poorly maintained ablution facilities. Preventing or minimising the potential pollution of surface water as a result of increased traffic frequency. In accordance with Government Notice 704 (GN 704), the 	<ul style="list-style-type: none"> Toilets must be easily accessible and a maximum of 50 m from the Works area where possible to ensure they are utilised; Sewage treatment and disposal must be implemented according to best practice methods and standards and care should be taken that no leaking of sewage take place; and Treated sewage must be disposed of at a suitable licenced facility. Sufficient washing facilities must be provided for workers. Wash areas must be placed and erected in such a manner that the surrounding areas, including soil and groundwater are not polluted; The facilities should be regularly serviced to reduce the risk of topsoil, surface- and/or groundwater pollution; <p>Stormwater:</p> <ul style="list-style-type: none"> Should any signs of erosion be found, remedial action such as backfilling, compaction and re-vegetation must be taken immediately to avoid exacerbation of the erosion; Stormwater must be channelled away from the exposed area for the duration of the operational phase; 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
	<p>onsite management should:</p> <ul style="list-style-type: none"> ▪ Keep clean and dirty water separated; ▪ Contain any dirty water within a system; and <ul style="list-style-type: none"> • Prevent the contamination of clean water. 	<ul style="list-style-type: none"> • The maintenance of stormwater and waste water containment facilities must be done in accordance with the final stormwater management plans as approved; • All stormwater infrastructure on site must be maintained and kept clean throughout the operational period; • The ESM must ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Impediments to or blockage of natural water flow must be avoided wherever possible; • All stormwater that would naturally run across the pollution areas must be diverted via channels and trapezoidal drains designed to contain the 1:50 year flood; • All equipment must be well maintained and fully operational at all times; • Any surface runoff generated which has a high suspended solid content will be collected at the point source in an appropriate containment facility, then be allowed to settle before discharged into the environment; • All water discharged to the environment must first be cleared of hydro-carbons and subsequent release into the 			


Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<p>environment must be within the allowable limits as per DWS General Limits.</p> <p>Solid Waste and Waste Water Management:</p> <ul style="list-style-type: none"> • Liquid hazardous waste must be contained and stored according to the following measures: <ul style="list-style-type: none"> ▪ Storage and classification of hazardous waste to be in accordance with the waste classification and management regulations GNR 634-635; ▪ A designated skip for all hazardous waste must be made available on site. Skips must also be closed - no rain water to enter the skips; and ▪ All drip trays / bunds / other temporary storage containers must be inspected for freeboard after rain and appropriate spill kits used to remove content; <p>Spillages:</p> <ul style="list-style-type: none"> • Heavy earthmoving equipment must utilise drip trays and ground sheets to prevent spillage and contamination of the soil; • In the event of pollution caused as a result of operational activities, the ESM / Applicant, according to Section 20 of 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<p>the National Water Act, 1998 (Act No. 36 of 1998) [as amended] will be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas;</p> <ul style="list-style-type: none"> • Immediate reporting of any polluting or potentially polluting incidents to ensure appropriate measures are implemented; • Fuel and oil spills must be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site; • In case of any spillage, the ESM must be informed in order for him/her to investigate the incident and recommend appropriate mitigation measures; • Measures must be implemented to prevent a recurrence of a spillage event; • Bunds or traps to ensure full containment of hydrocarbon and other hazardous materials must be used; 			

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> • Ensure that all contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited. • Exposed surfaces must be kept to a minimum to decrease the volume of dirty run-off generated; • Site operators and designated staff must be trained to supervise the response to spill incidents. <p>General</p> <ul style="list-style-type: none"> • Good housekeeping and management principles must be implemented; • Minimise the spatial footprint of the development to the greatest degree possible; • Make use of existing infrastructure such as roads, bridges and servitudes so as to minimise impacts; • Education on this impact must be included in the Environmental Awareness training content provided to decommissioning workers. 			
<ul style="list-style-type: none"> • Although no heritage features including archaeological, historical 	<ul style="list-style-type: none"> • Preserve heritage resources and / or prevent the destruction 	<ul style="list-style-type: none"> • Should any earthworks be conducted on site e.g. for installation or maintenance of services or other purposes, and any heritage objects, or what might be suspected to be 	During the operational phase, upon	Contractor / Environmental Site Manager	Incident register
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Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>and paleontological resources were identified by the specialist on site, these features may occur below ground and can therefore be discovered and altered during the operational phase through potential earthworks that may be required in future.</p>	<p>of heritage remains on or adjacent to the site.</p>	<p>heritage objects discovered / uncovered, all activities must be suspended pending further archaeological investigations by a qualified archaeologist.</p> <ul style="list-style-type: none"> Should skeletal remains be exposed, all activities must be suspended and the relevant heritage resources authority contacted (National Heritage Resources Act, 25 of 1999 section 36 (6)). 	<p>discovery of suspected heritage objects or skeletal remains.</p>	<p>(ESM) / Qualified Archaeologist</p>	
<ul style="list-style-type: none"> During the operational phase, there may be an increase in heavy vehicles utilising the roads due to delivery of the LSR gas to the development site that may cause, at the very 	<ul style="list-style-type: none"> To prevent impact on the aesthetic quality and sense of place of the town. 	<ul style="list-style-type: none"> Ensure that as much existing vegetation (other than exotic invaders) is retained wherever possible, especially on the periphery of the project area. This will act as dust collectors and break the monotony of large expanses of exposed earth; Dust suppression measures must be in place at all times; 	<p>During the operational phase</p>	<p>Contractor / Environmental Site Manager (ESM) Landscape Architects</p>	<p>Vegetation Management Plan Air quality monitoring reports</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>least, a visual nuisance to other road users and land owners in the area. In this environment, dust caused by vehicles driving on dirt roads, is also likely to represent a visual impact.</p>		<ul style="list-style-type: none"> Only the footprint and a small buffer zone around the proposed development should be exposed. In all other areas, the indigenous vegetation must be retained; Light pollution must be kept to a minimum wherever possible as light at night travels great distances. Security flood lighting should only be used where absolutely necessary and carefully directed, preferably away from sensitive viewing areas. Wherever possible, lights should be directed downwards so as to avoid illuminating the sky; Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way; and Ensure that rubble, litter and disused materials are managed and removed regularly. 		Flora specialists	
<ul style="list-style-type: none"> Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the delivery vehicles, 	<ul style="list-style-type: none"> Reduce noise impacts to a minimum. Preserve the hearing health of workers and visitors to the site. 	<ul style="list-style-type: none"> Noise fixed facilities should be located well away from the external noise sensitive areas and office areas within the plant area itself. All delivery and other vehicles and machinery are to be kept in good repair. 			<p>Vehicle and machinery maintenance schedules and records up to date.</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>machinery and noisy activities.</p> <ul style="list-style-type: none"> Disturbance due to vibrations caused by delivery vehicles. 		<ul style="list-style-type: none"> In general, operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993); Staff working in areas where the 8-hour ambient noise levels exceed 75dBA should wear hearing protection equipment. 			
<p>Stack emissions (including NO_x, PM, NO₂) including:</p> <ul style="list-style-type: none"> Off-gas from the sintering furnace's heating, drying and sintering zones; Off-gas from the sintered pellet handling plant (the screening station, product discharge points and conveyors); 	<ul style="list-style-type: none"> Prevent and minimise emissions altering air quality and contributing to climate change; 	<p>Implement the Air Quality Management Plan;</p> <p>The main objective of air quality management measures for the proposed upgrade of the Pelletiser at Tubatse is to ensure that all operations associated with the expansion will be in compliance with South African Air quality requirements. In order to define specific management objectives, the main sources of pollution needed to be identified. Sources can be ranked based on sources' strengths and impacts. Once the main sources have been identified, target control efficiencies for each source can be defined to ensure acceptable cumulative ground level concentration.</p> <p>The dust extraction systems around the final product screens and a pellet feeder (bottom layer feeder) inside the plant building will be upgraded. This is expected to improve the dust</p>	<p>As per Air Quality Management Plan and Monitoring Programme and AEL.</p>	<p>Applicant, ECO / Environmental Manager</p>	<p>Air Quality Management Plan</p> <p>Air quality monitoring reports</p> <p>Air Emissions License and Amendment</p> <p>Proof of emissions reporting on the NAEIS System</p>
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Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records																																
		<p>fallout significantly, and to reduce PM10 emissions. Improved emission levels are also expected to be reached with the new set of scrubbers to be installed as part of the project.</p> <p>Appliances and measures to prevent air pollution</p> <table border="1"> <tr> <td colspan="2">Drying zone 1 – Scrubber #1</td> </tr> <tr> <td>Media</td> <td></td> </tr> <tr> <td>Gas volume</td> <td></td> </tr> <tr> <td>Water volume</td> <td></td> </tr> <tr> <td colspan="2">Drying zone 2 – Scrubber #2</td> </tr> <tr> <td>Media</td> <td></td> </tr> <tr> <td>Gas volume</td> <td></td> </tr> <tr> <td>Water volume</td> <td></td> </tr> <tr> <td colspan="2">Heating zone – Scrubber #3</td> </tr> <tr> <td>Media</td> <td></td> </tr> <tr> <td>Gas volume</td> <td></td> </tr> <tr> <td>Water volume</td> <td></td> </tr> <tr> <td colspan="2">Sintering zone – Scrubber #4</td> </tr> <tr> <td>Media</td> <td></td> </tr> <tr> <td>Gas volume</td> <td></td> </tr> <tr> <td>Water volume</td> <td></td> </tr> </table>	Drying zone 1 – Scrubber #1		Media		Gas volume		Water volume		Drying zone 2 – Scrubber #2		Media		Gas volume		Water volume		Heating zone – Scrubber #3		Media		Gas volume		Water volume		Sintering zone – Scrubber #4		Media		Gas volume		Water volume				of the Department of Environmental Affairs.
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Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		Furnace inlet de-dusting – Scrubber #5			
		Media	Water		
		Gas volume	40 000 Nm ³ /h		
		Water volume	11 m ³ /h		
		Furnace outlet de-dusting – Scrubber #6			
		Media	Water		
		Gas volume	40 000 Nm ³ /h		
		Water volume	11 m ³ /h		
		Final Product de-dusting – Scrubber #7			
		Media	Water		
		Gas volume	40 000 Nm ³ /h		
		Water volume	11 m ³ /h		
<ul style="list-style-type: none"> Fugitive dust emissions including Particulate Matter and Total Suspended Particulate emissions: Process fugitive emissions: 	<ul style="list-style-type: none"> Prevent and minimise emissions altering air quality and contributing to climate change; 	<ul style="list-style-type: none"> Implement additional dust suppression measures such as “Rain Bird” water sprays if required; Have standby equipment available should equipment fail; Undertake regular monitoring of air quality and dust fall; Maintain machinery and exhaust systems. 	Operational Phase As per monitoring programme and Air Quality	Applicant, ECO / Environmental Manager	Air Quality Management Plan Air quality monitoring reports

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<ul style="list-style-type: none"> Process fugitive particulate emissions as a result of sintering and handling operations within the pelletising plant building PM10 emissions are assumed to be 75% of total particulate emissions, which is a conservative assumption. 			Management Plan and AEL.		Air Emissions License and Amendment Proof of emissions reporting on the NAEIS System of the Department of Environmental Affairs.
<ul style="list-style-type: none"> Fugitive dust emissions: Materials handling Materials handling points associated with the pelletising plant include raw material delivery by 	<ul style="list-style-type: none"> Prevent and minimise emissions altering air quality and contributing to climate change; Prevent and minimise health and visual impacts. 	<ul style="list-style-type: none"> Implement additional dust suppression measures such as “Rain Bird” water sprays if required; Have standby equipment available should equipment fail; Undertake regular monitoring of air quality and dust fall; Maintain machinery and exhaust systems. 	Construction Phase As per monitoring programme and Air Quality Management Plan and AEL.	Applicant, ECO / Environmental Manager	Air Quality Management Plan; Air quality monitoring reports;

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
truck and conveyor transfer points.					Air Emissions License and Amendment; Proof of emissions reporting on the NAEIS System of the Department of Environmental Affairs.
Fugitive dust emissions: Vehicle entrainment of dust from paved roads. • On entering the TFC site, trucks delivering raw materials for use at the pelletising plant travel on a section of	<ul style="list-style-type: none"> Prevent and minimise emissions altering air quality and visual and health impacts. 	<ul style="list-style-type: none"> Implement additional dust suppression measures such as “Rain Bird” water sprays if required; Have standby equipment available should equipment fail; Undertake regular monitoring of air quality and dust fall; and Maintain machinery and exhaust systems. 	Operational Phase As per monitoring programme and Air Quality	Applicant, ECO / Environmental Manager	Air Quality Management Plan Air quality monitoring reports

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>paved road of approximately 400 m in length. These trucks have an average payload of 28 tons and an average weight of 33 tons. Site specific particle size analysis determined the silt loading of the paved surface to be 307 g/m². The TFC entrance road is swept on a regular basis and a control efficiency of 75% were applied to emission calculations.</p>			<p>Management Plan and AEL.</p>		<p>Air Emissions License and Amendment</p> <p>Proof of emissions reporting on the NAEIS System of the Department of Environmental Affairs.</p>
<ul style="list-style-type: none"> Traffic associated with the bulk delivery of LSR. 	<ul style="list-style-type: none"> Prevent disruption of traffic. 	<ul style="list-style-type: none"> Delivery should be schedule without peak traffic times as far as possible. 	<p>At all times during the</p>	<p>Delivery contractors</p>	<p>N/A</p>

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
			operational phase.	Applicant ESM	
<ul style="list-style-type: none"> Access Control 	<ul style="list-style-type: none"> To protect the safety of workers and visitors to the site. 	<ul style="list-style-type: none"> 24 hour access control 	At all times	Applicant	Visitor records
<ul style="list-style-type: none"> Possibility of operational activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners, visitors and workers. 	<ul style="list-style-type: none"> Prevent veld fires and destruction of veld and animals as well as property and the resulting economic impact. 	<ul style="list-style-type: none"> The Applicant must have operational fire-fighting equipment available on site at all times. The level of fire-fighting equipment must be assessed and evaluated through a typical risk assessment process. It may be required to increase the level of protection, especially during the winter months. 	During the operational phase, especially during the dry season.	Applicant	Safety policy including fire-fighting and prevention measures.
<ul style="list-style-type: none"> Increased risk to public health and safety: Dangerous areas and activities poses health risks and possible loss of 	<ul style="list-style-type: none"> To prevent nuisance and health and safety accidents to the surrounding land users. 	<ul style="list-style-type: none"> Regular health and safety audits must be conducted and documented; A health and safety plan in terms of the Occupational Health and Safety Act should be drawn up and implemented to ensure worker safety; 	During the operational phase	Applicant / Contractor / Environmental Site Manager (ESM) / Health	Toolbox talks and staff briefing attendance registers;

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
life to n workers and visitors to the site.		<ul style="list-style-type: none"> • A health and safety control officer must monitor the implementation of the health and safety plan for the operational phase: • All personnel working for, or on behalf of, the contractor as well as all visitors are to be outfitted with the required PPE; • Site and operational personnel are prohibited from sensitive environments as indicated on the sensitivity map; • Ablution facilities and areas are to be clearly demarcated and clear signage to be erected; • Ablution facilities must be maintained weekly and kept clean as well as be inspected for any leaks that could lead to water loss; • Potable water points are to be clearly demarcated and maintained; • Ensure potable water complies with the NWA general limit requirements for drinking water. If necessary, potable water must be treated prior to consumption. If no filtration system is available, the Applicant must supply all employees, Contractors and visitors with potable water (at least 2 litres daily). 	Audits to be conducted as and when required by applicable legislation and guidelines and standards.	and Safety Officer	Training programme; Training certificates; Health and Safety Audit Reports.

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<ul style="list-style-type: none"> Security risks: Trespassing of workers on adjacent properties and possible crime e.g. poaching. 	<ul style="list-style-type: none"> To protect the safety and interests of the surrounding community from potential crime and poaching. 	<ul style="list-style-type: none"> Unsociable activities such as consumption or illegal selling of alcohol, drug use or selling within the site area are prohibited; Any persons found to be engaged in such activities shall have disciplinary and / or criminal action taken against them; No person shall enter the site unless authorised to do so by security personnel; Trespassing on private / commercial properties adjoining the site is forbidden; The site should be secured in order to reduce the opportunity for criminal activity in the locality; Fencing must be accompanied by signage indicating the site and contractors, emergency numbers, and good practice safety and security signs; No personnel, except for security staff, are allowed to stay/live on the site. Security staff is to be provided with accommodation and ablution facilities and communication equipment; and 	Operational Phase	Applicant / Contractor / Environmental Site Manager (ESM) / Health and Safety Officer	Toolbox talks and staff briefing attendance registers; Training programme; Training certificates

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
		<ul style="list-style-type: none"> Visitors are to complete the site visitor diary as well as a brief induction. The site visitor diary is to be kept at the site camp by the ESM for record purposes. Induction must include an introduction to the site and project, the authorised and unauthorised accesses as well as good practice safety procedure. 			
<ul style="list-style-type: none"> Damage or destruction of existing infrastructure in the near vicinity of the proposed activities. Impacts on existing infrastructure, services and servitudes. 	<ul style="list-style-type: none"> To prevent damage to services infrastructure such as powerlines, roads, bulk water supply and sewage pipes and resulting disruption of services. 	<ul style="list-style-type: none"> Heavy vehicles should remain on designated roads and are not allowed to drive onto other areas; Any incidents should be reported to the correct responsible person immediately and to the municipality / service provider. 	Operational Phase	Applicant / Contractor / Environmental Site Manager (ESM) / Health and Safety Officer	Toolbox talks and staff briefing attendance registers; Training programme; Training certificates
<ul style="list-style-type: none"> Socio-economic impact on farmers and surrounding land owners and users due to negative impacts on 	<ul style="list-style-type: none"> To prevent and minimise negative impact on farmers and surrounding 	<ul style="list-style-type: none"> All the recommended mitigation measures within this EMPR, to be implemented. Thubatse furthermore implements groundwater monitoring programme 	Operational Phase	Applicant / Contractor / ESM / ECO / Health and Safety Officer	Toolbox talks and staff briefing attendance registers;

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
groundwater, dust pollution, noise pollution etc.	landowners and occupiers.				Training programme; Training certificates

Table 8: Decommissioning Phase Management Measures

Description of Impacts	Management Objectives	Mitigation and Monitoring Measures	Frequency / timeframe	Responsibility	Records
<p>Most of the impacts associated with the construction phase will also be applicable during the decommissioning phase, and mitigation measures for the construction phase, should be implemented during the decommissioning phase, where applicable. Refer to Section 8.1 of the EMPR.</p>					

9. MONITORING

9.1 Air quality monitoring

9.1.1 Methodology


Dust buckets of a standard size and shape are prepared and are set up at locations on the borders of the property, relating to the main compass points, so that dust can settle in them for periods of 30+/-2 days. The dust buckets are sealed on site and sent to a laboratory for analysis. The masses of the water-soluble and –insoluble components of the material collected are then determined and results are reported as mg/m²/day. This methodology is described according to South African National Standards 1929:2011 and the American Society for Testing and Materials (ASTM) Designation: D 1739-98 (2010). The results for this method of testing are obtained by gravimetric weighing. The apparatus required for this type of monitoring include open-top buckets/containers no less than 150mm in diameter with a height of no less than twice its diameter. The buckets must be placed on a stand at a height of 2+/-0.2m above the ground.

9.1.2 Monitoring Objectives

Gravimetric Dust Fallout measurements are performed in accordance with the Government Notice 827 (National Dust Control Regulations) of the National Environmental Management: Air Quality Act 39 of 2004, as published in the Government Gazette (No. 36974), 1 November 2013. The South African National Standards 1929:2011 and the American Society for Testing and Materials (ASTM) Designation: D 1739-98 (2010) methods are used for measuring dust fallout rates and as a guideline for sampling point location as prescribed by GN 827.

Monitoring Objectives

- Ensuring that the environmental mitigation and control measures are implemented;
- Monitoring environmental performance of the Tubatse operations;
- Tracking of progress due to pollution control measure implementation;
- Compliance with all relevant legal and statutory requirements;
- Promotion of environmental education and protection;
- Application of the Best practice principle; and
- Classification of areas where samplers are located.

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9.1.3 Ambient Air Quality

9.1.3.1 Monitoring point layout maps

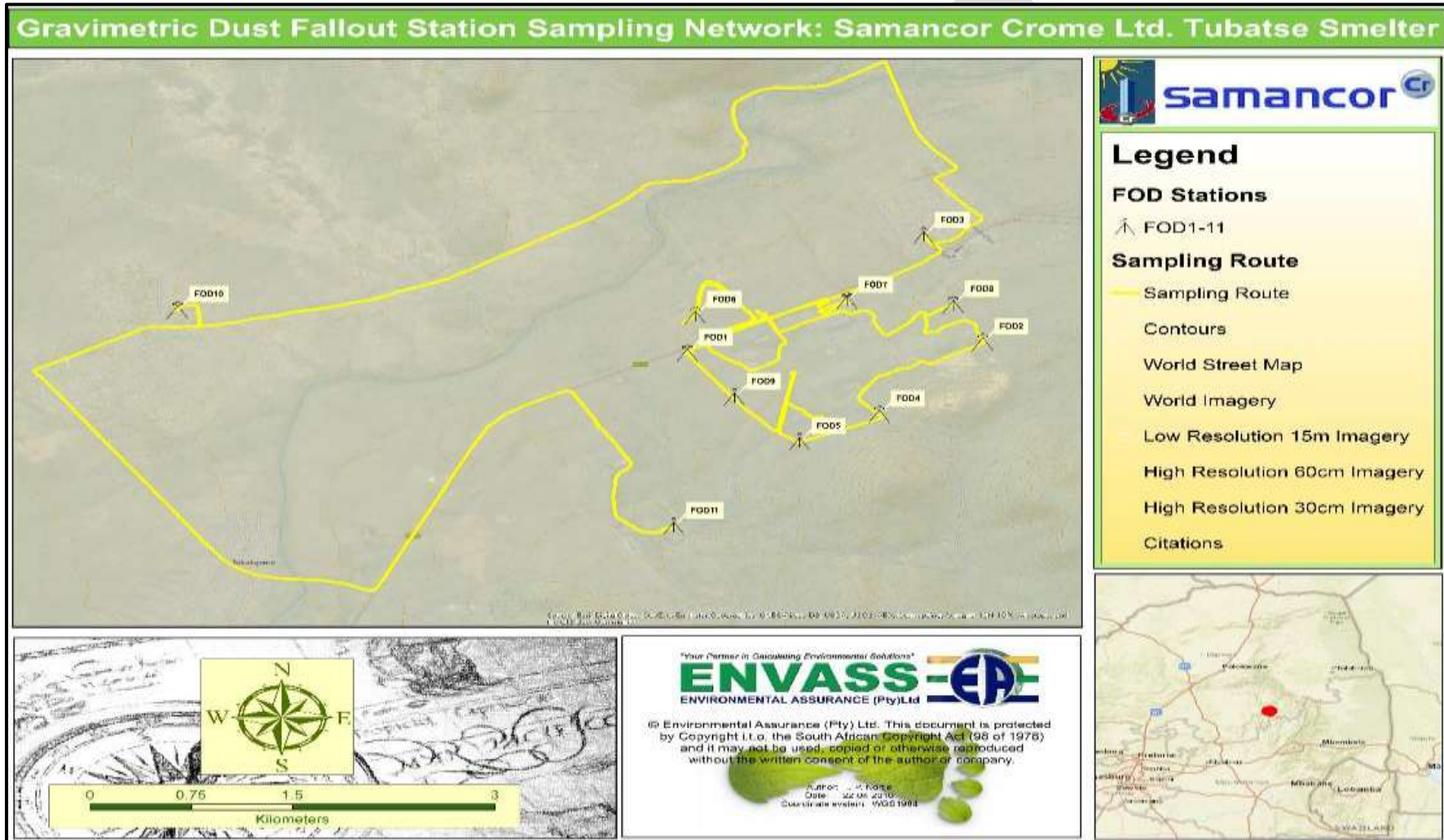



Figure 6: Location of fallout dust monitoring points

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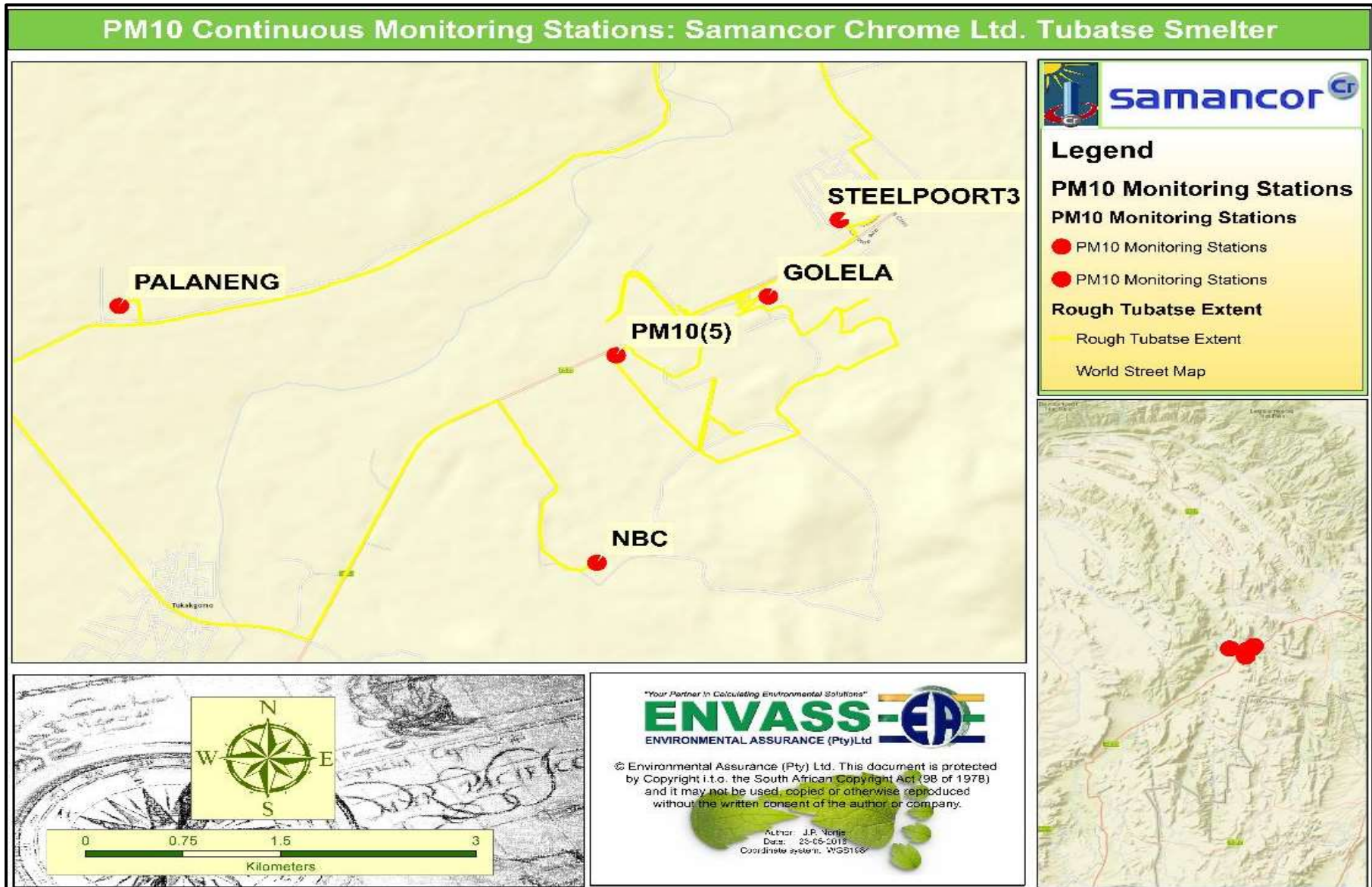


Figure 7: Location of PM10 continuous monitoring stations

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9.1.3.2 Limits and standards

The limits of the SANS 1929:2011 Standard are given in Table 4. According to GNR 827, only the first two rows are applicable to legislation, however all four will be used as a reference of gravimetric dust fallout.

Table 9: Four-band scale evaluation criteria for dust deposition (SANS 1929: 2011)

Band Number	Band Description level	Band Description level	Dust fallout rate (D)(mg/m ² /day, 30 day average)	Comment
1	Residential	Ideal	D > 600	Permissible for residential and light commercial
2	Industrial	Acceptable	600 < D < 1200	Permissible for heavy commercial and industrial
3	Action	Tolerable	1200 < D < 2400	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	Unacceptable	2400 < D	Immediate action and remediation required followed the first incidence of dust fallout rate being exceeded. Incidents report to be submitted to the relevant authority.


Table 10: Interim and target limits for PM₁₀ as per SANS1929 (2011)

1	2	3
Average Period	Concentration µg/m ³	Frequency of exceedances
Interim		
24 Hours	120	4
1 Year	50	0
Target		
24 Hours	75	4
1 Year	40	0

10 TRAINING AND ENVIRONMENTAL AWARENESS PLAN

The following principles and training will apply to the Environmental Awareness Plan (safety, health and environmental (SHE) training and the Environmental Management System (EMS) training):

- All personnel, including contactors will as a minimum undergo general SHE induction and awareness training;

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- The Safety, Health, Environmental and Quality (SHEQ) Manager will identify the SHE training requirements for all personnel and contractors. The training requirements will be recorded in a training needs matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix will be administered by the Training Department; and Development of the Training Programme, which will include:
 - Job specific training – training for personnel performing tasks which could cause potentially significant environmental impacts;
 - Assessment of extent to which personnel are equipped to manage environmental impacts;
 - Basic environmental training;
 - EMS training;
 - Comprehensive training – on emergency response, spill management, etc;
 - Specialised skills;
 - Training verification and record keeping; and
 - Periodic re-assessment of training needs, with specific reference to new developments, newly identified issues and impacts and associated mitigation measures.

10.1 General Awareness Training

- The HR Manager, together with the SHEQ Manager, will be responsible for the development of, or facilitating the development of, the required general SHE induction and awareness training. A general environmental awareness training module will be developed and integrated into the general induction programme. The general awareness training must include the Environmental Policy, a description of the environmental impacts and aspects and the importance of conformance to requirements, general responsibilities of personnel and contractors with regard to the environmental requirements and a review of the emergency procedures and corrective actions; and
- A Training Practitioner will conduct the general awareness training. The training presenter will keep a record of the details of all persons attending general awareness training. Such attendance registers shall indicate the names of attendants and their organisations, the date and the type of training received.

10.2 Specific Environmental Training

- Specific environmental training will be in line with the requirements identified in the training matrix; and
- Personnel whose work tasks can impact on the environment will be made aware of the requirements of appropriate procedures/work instructions. The SHEQ Manager will communicate training requirements to responsible supervisors to ensure that personnel and contractors are trained accordingly.

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10.3 Training Evaluation and Re-training

- Effectiveness of the environmental training will be reflected by the degree of conformance to EMPr requirements, the result of internal audits and the general environmental performance achieved;
- Incidents and non-conformances will be assessed through the Internal Incident Investigation and Reporting System, to determine the root cause, including the possible lack of awareness/training;
- Should it be evident that re-training is required, the SHEQ Manager will inform the managers of the need and take the appropriate actions;
- General awareness training of all personnel shall be repeated every year; and
- The re-induction shall take into consideration changes made in the EMPr, changes in legislation, current levels of environmental performance and areas of improvement.

10.4 Emergency Procedures

- Emergency procedures, as relevant to this project, shall be implemented;
- The SHEQ Manager shall define emergency reporting procedures for the project;
- All personnel shall be made aware of emergency reporting procedures and their responsibilities;
- Any spills will be cleaned up immediately in accordance with relevant legislation; and
- Telephone numbers of emergency services, including the local firefighting service, shall be conspicuously displayed.

11 REPORTING


11.1 Record keeping

The ESM (or SHEQ Official) and the ECO will continuously monitor the adherence to the approved impact prevention procedures and the EMPr. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the applicant / ESM (SHEQ official) in a monthly report. These reports shall be made available to the competent authority when requested.

The ESM (SHEQ Official) / applicant shall ensure that an electronic filing system identifying all documentation related to the EMPr is established.

A list of reports and documents generated and to be generated during the operations is provided below, and all applicable documentation should be included in the environmental filing system catalogue or document retrieval index.

- Approved Environmental Management Programme;
- Final Approved Basic Assessment Report;


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- Environmental Authorisation;
- The Water Use License;
- Any other environmental authorisations or permits;
- Rehabilitation Plan;
- Monitoring Programme;
- Groundwater Management Plan;
- All communications detailing changes of design / scope that may have environmental implications;
- Daily, weekly and monthly site monitoring reports;
- Complaints register;
- Medical reports;
- Training manual;
- Training attendance register;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Spill procedures;
- Copies of all relevant environmental legislation;
- Permits and legal documents, including letters authorising specific personnel to do their duties as part of emergency preparedness teams e.g. fire teams etc.;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during decommissioning;
- Audit reports;
- Copies of all Safety Data Sheets;
- All relevant permits; and
- All method statements, if any.

11.2 Document Control


The ESM (SHEQ Official) shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents should be identifiable by organisation, division, function, activity and contact person;
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution; and
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

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The ESM (SHEQ Official) shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents shall be made available to the independent external auditor or ECO.

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